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27 July 1979

Worldwide Report

ENVIRONMENTAL QUALITY

No. 219



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ENVIRONMENTAL PLANNING BODY URGED FOR WEST AUSTRALIA

Liberal Party Proposal

Perth THE WEST AUSTRALIAN in English 16 May 79 pp 4, 19

[Text] The WA Liberal Party has proposed that a body be set up to enable the public to take part in environmental planning procedures.

It has also recommended the establishment of a Cabinet review group to coordinate the use of land and environmental management and to resolve conflicts.

It wants continuing feasibility studies on the use of nuclear power, with particular emphasis on finding better solutions to the problems of nuclear waste disposal, reactor safety and nuclear safeguards.

The proposals are contained in an environmental management policy released yesterday.

A party sub-committee spent about six months preparing the document, which has been framed as a result of experience gained from environmental legislation.

The party's policy committee and its State council have endorsed the proposals.

The policy presented a clear alternative to the disruptive approach which had characterised environmental affairs in recent years, the document said.

It said: "We reject totally the idea that we are on the brink of environmental disaster, because this leads to attitudes of glooms and pessimism and deprives us of sens-

ible policies for the future.

"It is our view that the common good can be served without creating chaos in our social and economic systems."

The policy recognised that environmental concern must be brought into balance with the needs for industrial and economic growth so that jobs would be provided for an ever-growing work force, the document said.

The proper role of government in environmental management was that of regulator of the private enterprise system and of government agencies and instrumentalities.

The policy was prepared in consultation with the party's parliamentary wing.

It is designed to provide a basis for Government policy at the next State election, but it is not binding on the parliamentary Liberal Party.

The Minister for Conservation and the Environment, Mr O'Connor, said he had not had a chance to study the document thoroughly.

The party's general secretary, Mr C. Porter, said that the document covered an important policy area.

There was no special significance in the timing of its release.

The document said that no policy would be more than a stop-gap measure unless the whole community developed a sense of responsibility for improving environmental and conservation standards.

Voluntary non-government organisations, community groups and expert bodies from science and industry had a significant part to play in improving standards.

The document said the Government should make sure that environmental reviews were prepared for development projects that were likely to have a significant effect on the environment.

It should also streamline the method and procedure for environmental reviews, establish consistent guidelines and practices for preparing reviews and promote more public awareness of environmental issues, the document said.

It also recommended that the Government should:

- Develop a planning approach that would enable it to establish broad goals and policies with implementation at the local level.

- Examine the need for a comprehensive land-use survey with the aim of establishing a land-use data bank.

- Study with government agencies the need to improve techniques for making land-use surveys.

The document said that WA had a responsibility to develop its natural resources, especially minerals, in its own and in the national interest.

The declaration of the 200 nautical mile (370km) limit off the Australian coast extended the responsibility for developing natural resources to an area almost double the nation's land area.

Measures were needed to protect the coastline, including strategies developed through the Environmental Protection Authority.

There should be environmental reviews where sand mining or coastal or river development was proposed.

The document suggests that several measures be taken through the EPA aimed at achieving a balance between economic growth and conserving the environment.

It suggests, that in pollution control, perform-

ance standards should be preferred to technological specifications.

Co-operation between State, local and federal authorities was needed on land-use planning.

The document also urges the Government to:

- Upgrade existing programmes to monitor and combat pollution of the sea, specially by oil and heavy metals.

- Consider establishing a marine science institute to protect the marine environment and promote orderly development of sea resources.

- Extend research into the effects of forestry

practice on jarrah die-back, wildlife and the general environment.

- Encourage the development of efficient ways of monitoring air, water and noise pollution.

- Have environmental guidelines and safeguards written into all State contracts.

- Review waste-disposal techniques used in the metropolitan area in co-operation with local government to ensure that ground water would not become contaminated.

- Examine resource recovery systems and ways of improving the disposal of materials that cannot be recycled.

Proposal a 'Positive Note'

Perth THE WEST AUSTRALIAN in English 18 May 79 p 6

[Editorial: 'Environment']

[Text]

Mention the word environment these days and you invite heated debate on an issue as complicated and divisive as any on modern society's check-list of headaches. At one extreme are proponents of the idea that any environmental argument standing in the path of development is to be resisted; at the other are prophets of doom who see the felling of one more tree or the digging of one more hole as an environmental death sentence.

Steering an appropriate course between these two standpoints is as much a challenge to the community as it is to governments. Professor D. O'Connor, of Murdoch University, highlighted the problem this week when he told a science conference in Perth that people found it hard to know what to believe. Many errors of fact had been getting into print, he said, and experts had opposing views. His own opinion, however, was a positive and encouraging one: It was possible to have growth and conservation side by side. What was needed was a rebirth of man's confidence to be able to develop in harmony with nature.

Another positive note was sounded this week in proposals put forward by the WA Liberal Party to widen the public role in environmental planning procedures. The party believes that its policy presents a clear alternative to the disruptive approach which has characterised environmental affairs in recent years. Against a background of world-wide environmental conflict, an end to disruption is, perhaps, hoping for too much. But the importance of the party's message should not be overlooked: No policy will be more than a stop-gap measure unless the whole community develops a sense of responsibility for improving environmental and conservation standards.

If it is to make a useful contribution, that sense of community responsibility must be guided by a sound understanding of all the issues involved. That is the hard part. Though the State Government has improved its technique of public consultation on projects affecting the environment, it is easy to become confused. The consultation process, hampered by political smokescreens, demands a good deal of mental effort on the public's part. An environmental review and management programme on a mining proposal, for example, can be a lengthy and technically-worded document. It is not to be understood or fully appreciated in a five-minute scan at a public library.

But it is becoming increasingly important for the lay person to make the effort and become involved. If the Liberal Party proposals could help in promoting better public understanding and ensuring a greater public contribution at the environmental planning stage, they would be well worthwhile.

As for the technical hurdles and the disagreement among experts, we can do no better than follow the advice of Professor O'Connor and trust in our common sense.

AUSTRALIA

NORTH WEST SHELF PROJECT DRAFT IMPACT STATEMENT ISSUED

Sydney THE SYDNEY MORNING HERALD in English 19 May 79 p 32

[By J. N. Pienow]

[Text]

The North West Shelf natural gas development project issued its draft environmental impact statement yesterday amid growing signs of reluctance by Japanese buyers to make an early commitment on contracts.

The project's partners, led by BHP and Shell, need the assurance of 20-year supply contracts for liquefied natural gas before committing themselves to a capital expenditure expected to be between \$2,500 million and \$3,000 million.

They had hoped to have a letter of intent or other "bankable document" for Japanese purchases of about five million tonnes of LNG a year by the time their \$50 million project definition study is completed in August.

However, the Herald's Tokyo correspondent, John Slee, quotes trade reports that a Woodside selling mission has found Japanese electric power companies and city gas suppliers reluctant to sign letters of intent this year.

The reason given by some power companies is that it will take them a long time to buy land and get approval from local residents for the new power stations needed for an LNG power generation program.

Japan is already drawing LNG from Brunei, Alaska, Abu Dhabi and Indonesia and has been offered supplies by potential producers such as Sarawak and Qatar.

However, Australian sources describe the trade reports as the normal "kite-flying" accompanying Japanese negotiations on raw material supplies.

Yesterday's draft environmental impact statement, will be open for public comment until July 2. It says that the duration of the North West Shelf project could be well beyond the 20 years set as the time for LNG con-

tracts and the supply of pipeline gas to Western Australia.

"Production from the North Rankin field would not . . . cease after the envisaged 20 year period," it says.

"Other fields would by then have come into production and while LNG contracts might not be extended, it is foreseen that gas sales to Western Australia would continue for many more years."

If the project goes ahead, it will begin supplying piped natural gas to the West Australian market by about mid-1984 and will start shipping LNG later in that year.

Its eventual exports are planned to reach up to 6.5 million tonnes of LNG and 1.7 million tonnes of condensate a year.

The project will involve a construction workforce of between 3,000 and 4,000 over a four-and-a-half year period. Its onshore operational workforce is expected to be about 500.

The preferred site for the onshore treatment plant is South Withnell Bay, near the Hamersley iron ore port of Dampier. It is one of 12 sites examined over 200 kilometres of coastline between Cape Preston and Port Simpson as well as the islands in the Dampier Archipelago.

The FIS assesses the chances of a ship collision with the production platforms as "extremely remote" and says that US experience has shown that the incidence of production well blow-outs is "very small."

The two production platforms will be well clear of major shipping lanes and at night will be a blaze of lights detectable at considerable distances.

AUSTRALIA

STATE GOVERNMENTS PLAN TO COMBAT POLLUTION PROBLEMS

New South Wales Plan Announced

Sydney THE SYDNEY MORNING HERALD in English 18 May 79 p 3

[Text] The State Government plans to introduce a number of measures to combat Sydney's pollution problems.

The measures are aimed not only at controlling present pollution levels, but eventually at reducing them.

Announcing this yesterday, the Premier, Mr Wran, said the State Cabinet had endorsed a decision to set new exhaust emission levels for cars from January 1, 1981.

He said:

The Government would encourage, by education and promotion, the use of diesel and LPG-fuelled vehicles by private motorists and industry.

The Government was studying new controls on the release of vapours from petroleum-handling facilities, including large service stations, oil refineries, petro-chemical plants and industrial installations generally.

The evaporation of petroleum products during bulk handling procedures contributed significantly to photo-chemical smog, he said.

The government would have discussions with industry and bulk handlers to have measures introduced to reduce the amount of evaporation of petroleum products.

The departments of Environment, Energy and Transport had been asked to look at the wider problem of how the high level of photo-chemical smog could be controlled.

Mr Wran said steps must be taken to ensure that pollution in Sydney "does not consistently reach the levels of Tokyo and Los Angeles."

Motor vehicles were responsible for the largest proportion of Sydney's photo-chemical smog problem.

"Photo-chemical smog is a special and insidious form of pollution," he said.

"It affects people's health, damages plants and causes deterioration of rubber and many other materials.

"Control of photo-chemical smog in Sydney presents

the greatest single environmental challenge facing the State.

"The Government has decided to adopt a program of practical measures designed to arrest the growth of smog and, eventually, to reduce it.

"Stringent control of emissions from motor vehicles is, of necessity, an essential element of the program.

"This is in direct contrast to suggestions made recently that exhaust emission standards should be relaxed."

The Federal Government has asked that tighter vehicle emission exhaust rules be abandoned until 1985.

There has been strong opposition to tighter controls from the motor industry.

The decision on exhaust emission levels was foreshadowed by the Minister for Planning and Environment, Mr Landa, last month.

Victoria Plan Likely

Melbourne: THE AGE in English 19 May 79 p 11

[Text]

Victoria seems likely to get tougher vehicle pollution controls from January, 1981.

The Minister for Conservation, Mr. Houghton, said yesterday Victoria had not yet decided its stance on the tougher controls.

But he said that if tougher controls made manufacturers build more efficient engines then "that would be a good thing".

And the chairman of Melbourne University's Department of Mechanical Engineering predicted that manufacturers would be forced to produce a less pollution car if NSW and South Australia opted for tighter controls.

Mr. Bill Charters said it would be uneconomic for manufacturers to make two models — one for SA and NSW and one for the other 60 per cent of the vehicle market.

NSW cabinet decided this week to enforce stricter controls, and SA is expected to follow suit.

The Federal Government urged State Transport Ministers at their meeting in February to abandon the next stage of vehicle pollution restrictions until 1985.

Mr. Charters said some manufacturers already made 110 to 57 different engines,

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and a two-car system would be out of the question.

"If the manufacturers are forced to produce a low-emission car it will have to be one for all the states," Mr. Charters said.

"It will certainly cost extras, maybe a couple of hundred dollars extras."

Mr. Charters said it was a question of how much the public was prepared to pay to keep the air clean.

Mr. Houghton criticised some Australian cars which, he said, were inefficient.

"The design rule may lead to more efficient engines; engines which will not pollute but which will use less petrol."

"It can be done because it is being done in some cars already."

Mr. Houghton said it might be possible to exempt country drivers from some pollution controls designed for the city.

AUSTRALIA

DEBATE ON HERBICIDE 2,4,5-T CONTINUES, CLAIMS PENDING

Federal 'Cover-up' Alleged

Melbourne THE AGE in English 24 May 79 p 3

[From Simon Balderstone]

[Text] SYDNEY. — An academic claims that research linking 2,4,5-T with the birth defect spinabifida has been covered up by the Australian National Health and Medical Research Council.

The university research findings recommend that severe restrictions be placed on use of the herbicide.

The primary author, Dr. Barbara Field of Sydney University, says the NHMRC told her by letter not to publish the information which, she says, the council has ignored.

Dr. Field said she was requested to — and subsequently did — withdraw an article on the findings she had submitted to the British medical journal 'The Lancet'.

And an official from the US Environmental Protection Agency has claimed that the report has been withheld from the EPA.

But yesterday the NHMRC, the Federal Minister for Health, Mr. Hunt, and a professor associated with the "Field Report" all claimed there had been no cover-up, nor a request to withhold publication.

Professor Charles Kerr, a member of the NHMRC working party on 2,4,5-T and a co-signatory of one of the "Field Reports" submitted to the research council, says the working party is waiting for final research findings.

A spokesman for the NHMRC said yesterday the council had first received a research report in mid-December last year, but the arguments it had contained "did not stand up to analysis because of serious deficiencies in statistical reasoning which created major doubts as to the validity of the conclusion reached".

The report was titled: "Investigation of a possible association between use of the herbicide 2,4,5-T and the incidence of neural tube defects in NSW."

A revised version of the report had also been returned to Dr. Field at the Sydney University School of Public Health and Tropical Medicine with the recommendation that further work be carried out.

Speaking on the ABC radio programme AM yesterday, Dr. Field said the NHMRC had told her it could not make a decision on the research report.

A specialist researcher of birth abnormalities, Dr. Field said she had withdrawn an article in The Lancet after being asked to.

"I could not understand why they (the NHMRC) essentially ignored the whole thing," she said.

In CANBERRA Mr. Hunt has strongly denied there was any attempt to suppress the report.

The Health Minister said a revised version of Dr. Field's report was nearly finished and would be considered by the working party set up by the National Health and Medical Research Council to investigate 2,4,5-T.

Health Minister's Denial

Sydney THE SYDNEY MORNING HERALD in English 24 May 79 p 11

[Text]

The Minister for Health, Mr Hunt, denied yesterday that he or his department directed the author of a report on the association between the herbicide 245-T and neural tube defects in NSW not to discuss the issue publicly.

He confirmed that the report, by Dr Barbara Field, was received by his department late last year. It had been analysed by statistical and scientific experts from within and outside his department.

On March 6, the department had advised the School of Public Health and Tropical Medicine that the report and arguments in the paper "did not stand up to analysis."

A revised version of the study was then sent to an ad hoc working party on 245-T, convened by the National Health and Medical Research Council.

"The working party concluded that no opinion could be formed in view of the amount of additional work that still needed to be undertaken before it could be evaluated," Mr Hunt said.

Mr Hunt said the full report on the working party's own 245-T deliberations had been presented to the public health advisory committee of the NHMRC and would be formally submitted to the council at its June meeting.

"I can assure you that they will not hesitate to recommend restrictions on any substance if it is considered to be justified."

The Opposition's health spokesman, Dr R. E. Klugman, (Lab, NSW) said that where chemicals were questioned, "the benefit of the doubt ought to be given to the community and not the chemical."

Union Seeks Damages

Canberra THE AUSTRALIAN in English 24 May 79 p 3

[Excerpt] The Australian Workers Union is about to launch a legal battle to gain compensation for council workers who are said to have developed side-effects from using the herbicide 2,4,5-T.

A legal officer, Mr. Michael Arnold, is being briefed to fight six cases, one of which involves the death of a worker from cancer.

The herbicide is widely used by councils as a defoliant.

Mr. Arnold revealed the union's plan yesterday after it was claimed that a report linking 2,4,5-T with birth defects in NSW was being suppressed.

Former Servicemen's Claims

Melbourne THE AGE in English 22 May 79 p 5

[Text]

At least three Victorian ex-servicemen are preparing compensation claims for ill health they say was caused by the herbicide 2,4,5-T. (

The Vietnam veterans claim they were exposed to the defoliant Agent Orange — a 50/50 mixture of 2,4,5-T and 2,4-D — while on active duty.

In the United States at least 16 lawsuits are pending against six companies which manufactured defoliants used in Vietnam.

The RSL Federal president, Mr. Bill Keys, has written to veterans' groups in the US asking for information on the claims.

Nausea, lethargy

Mr. Bernard Szapiel, 33, of Rosanna, said yesterday he hoped to make a formal claim for the effects of the chemical.

"It is a big thing and it is really affecting my health and my capacity to support a family," Mr. Szapiel said.

"I have got physical nausea, vomiting, lethargy . . . and it has affected my eyesight."

Mr. Szapiel, who was unable to keep his teaching job, supports

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his wife and one child by working as a potter.

One of the Victorian men, aged 38, fathered an abnormal child.

A second was exposed to Agent Orange as it was sprayed from the air and suffered dizziness, nausea and headaches.

The two men, who do not wish to be identified, are seeking legal and medical advice before approaching the commission.

A spokesman for the Minister for Veterans Affairs, Mr. Adernann, said the commission would consider any claim made by the veterans. An exhaustive inquiry would probably be necessary.

A spokesman for the National Health and Medical Research Council said the council had considered a report on the US veterans' claims early last year.

He said the report showed "nothing in any way convincing".

"The question of 2,4,5-T has been under constant review for the past 10 years . . . and we will continue to monitor it," the spokesman said.

"It is obviously a very emotive issue."

"The inference is that the council is in some way covering it up or has a vested interest in using the stuff, that simply isn't true."

Council's Credibility Strained

Melbourne THE AGE in English 24 May 79 p 11

[Editorial: "Ignorance Is Not Bliss"]

[Text]

THE National Health and Medical Research Council, which has preferred to endorse the use of the controversial herbicide 2,4,5-T until "conclusive" proof is found that it is injurious to public health, is now being accused of muzzling a Sydney academic, Dr. Barbara Field, who believes she has found such evidence. If the allegations — that the council suppressed the evidence and pressured the doctor to withdraw a summary of her findings from a British medical magazine — are correct, the council deserves to be chastised by the Government. The facts are still unclear. The academic, from Sydney University's public health division, says she submitted a report to the council in December on the effects of the herbicide and followed it up with a more detailed report several months later. The documents are reported to contain evidence relating 2,4,5-T with the incidence of spina bifida and other ailments affecting babies' nervous systems. Yet the council has made no mention of the reports in its various statements in defence of the herbicide this year. The most alarming allegation, however, is that the council pressured the author of the report into withdrawing a summary of her findings from an internationally respected medical journal. The council is also said to have forbidden her from discussing her findings publicly. Dr. Field says her final recommendation was that "certain restrictions" be placed on the herbicide.

The council's credibility is already severely strained. It has elected on more than one occasion to defend 2,4,5-T despite evidence that clusters of birth defects have occurred in Victoria where the herbicide has been used. Evidence of an increase in miscarriages in an American town after 2,4,5-T spraying, which led to an emergency ban on the herbicide by the US Environment Protection Agency in March, was said by the council to be inconclusive. Seven weeks ago, the council said in a letter

to 'The Age' that a thorough examination of all available evidence had not provided "any substantiated scientific evidence of a causative link between the use of 2,4,5-T and excess occurrences of spontaneous abortion or human birth defects". But, on its own admission, some US data was unavailable and other information had not been given the statistical treatment necessary to arrive at valid conclusions regarding the herbicide's safety.

The council has taken the view that nothing should be done until there is proof that the herbicide damages health. It says evidence that birth deformities and unusually large numbers of miscarriages occur in areas where 2,4,5-T has been sprayed is not enough. The suggestion is that it might be a coincidence. We prefer to believe that until the coincidence is demonstrated, some restrictions should be placed on the herbicide. It is better to err on the side of safety. All that aside, we do not believe that hiding scientific advice, if that is what has happened, is in the best interests of the community. The council has every right to disagree with the findings of the Sydney study, or to send it back for more information. But it has no right to inhibit debate. Yesterday, the incident was being described as an unfortunate mix-up. The council said it was still waiting for the final, revised version of the Sydney study, but had not prohibited publication of Dr. Field's findings. The author, however, said in an ABC interview that she had been told in a letter from the council not to release or discuss the findings. Perhaps it is all a misunderstanding. But the basic problem is still with us — the authorities have been unable to convince many people that the herbicide is safe, a matter of damage claims from people who believe they have suffered as a result of the herbicide being used in their areas is due to hit the courts in the next few months, and 2,4,5-T is still being used.

GREAT BARRIER REEF OIL EXPLORATION CONTROVERSY REPORTED

History of Controversy

Brisbane THE COURIER-MAIL in English 19 May 79 p 18

[Feature, "This Week in Canberra", by Wallace Brown: "So What's the Situation with the Barrier Reef"]

[Text]

In all the talk, and double-talk, about drilling for oil in Great Barrier Reef waters, there are several basic points:

Federal National Development Minister Newman and Trade and Resources Minister Anthony want drilling to go ahead, without delay.

Queensland Premier Bjelke-Petersen and Mines Minister Camm want likewise.

Federal Science and Environment Minister Webster urges caution and expert scientific investigation.

According to public opinion polls, the majority of Australians, including a majority of Queenslanders, are opposed to drilling on or near the reef.

The Labor Party, the Australian Council of Trade Unions, the Australian Conservation Foundation, and other

environmentalists, are spalled, and will do everything they can to stop drilling — which in the case of the ACTU could mean a great deal.

Prime Minister Fraser is trying to sit on the fence, tends to side with Senator Webster, is weighing up the politics, wants to avoid a States-right type confrontation with Queensland along the lines of the Fraser Island argument, and indulges in semantics about the "reef" and "the environment of the reef".

And Premier Bjelke-Petersen wants the Queensland Government to regain control from the Commonwealth of the territorial seas, which in this context means Barrier Reef waters — and Prime Minister Fraser has indicated the Federal Government is prepared to do this.

As the issue flares, it is worth setting out the relevant facts in chronological order, because many key people involved have been considerably

less than forthright, if not deliberately devious:

1971: Royal Commissions on Great Barrier Reef oil drilling set up. Six petroleum exploration permits already allowed in the reef area — held by Australian Gulf Oil Company, California Asiatic Oil Company, Texaco Overseas Petroleum and Gulf Interstate Overseas Ltd. — suspended.

1974: Applications for renewal of these permits lodged by the companies. Decision deferred by the Federal (Whitlam) Government pending consideration of the Royal Commission recommendations.

1974: Royal Commission recommendations received. Two members say some drilling could take place. Chairman Sir Gordon Wallace advises against drilling until full scientific knowledge on likely consequences available.

June 20, 1975: Federal (Whitlam) Government's Great Barrier Reef Marine

Park Act, providing for establishment of marine park, becomes law. Act specifically says there shall be no mining activities of any kind within areas declared part of marine park.

October, 1977: Mr Anthony and Mr Newman (then Environment Minister) recommend to Cabinet that oil exploration and exploitation be allowed in Capricornia Channel, off Rockhampton. Submission not considered before 1977 election, and lapses.

April 6, 1978: Federal Environment Minister Groom tells Parliament the Marine Park Authority has recommended declaration of the first part of the marine park in the near future — this part to include the Capricornia and Bunker Group and Lady Elliott Island.

June, 1978: Premiers' Conference decides there shall be Federal-State negotiations handing back Commonwealth jurisdiction over the territorial seas to the States.

December 19, 1978: Mr Fraser writes to Senator

Webster, stopping proclamation of the Capricornia section of the reef as marine park until outcome of proposed discussions with Queensland on territorial seas is known.

December 24, 1978: Queensland Mines Minister Camm calls for oil exploration in reef waters.

January 5, 1979: Mr Newman writes to Senator Webster that "decisions on the renewal of permits are long overdue"

Advised

January 22, 1979: Mr. Newman writes to Senator Webster saying the Queensland Mines Department Under-Secretary has advised that his department would not object to declaration of the marine park, provided the holder of permits Q/4P and Q/5P (Gulf Oil) agree, and that only areas which Gulf Oil Proposes to relinquish are included in the park.

This letter of Mr. Newman's also says: "Furthermore, the declaration should not proceed until formal extension of State powers over the territorial sea has been accomplished

February 21, 1979: Mr. Fraser in the House of Representatives: "If we are talking about the environment of the reef but not the reef itself, we have to ask the question: Where does it begin? Where does it end? . . .

"But let me give a complete and unequivocal guarantee that this Government would not allow any drilling or any mining that would do anything to damage the reef."

March 21, 1979: Senator Webster writes to Mr. Newman: "I believe the need for research results to be available before decisions are taken on drilling as a corollary of the position taken by the Government."

April 5, 1979: Senator Webster writes to Mr. Newman: "I suggest that your department provide my department and the authority with specific details particularly as to the boundaries of the areas over which it is proposed to renew permits."

April 10, 1979 (in "The Australian"): The Queensland chairman of the Australian Petroleum Association (Mr. G. Swin-

don): "We can expect oil exploration in Great Barrier Reef waters within two to five years."

May 3, 1979: Senator Webster in the Senate: "The Capricornia Reef is not declared at the moment due to constitutional problems. So far as I am aware, absolutely no movement is pending to renew exploration permits in that area of the Great Barrier Reef."

"Not new"

May 3, 1979: Mr. Newman to myself: "There is no new programme for exploration". (Published in The Courier-Mail, May 4. He put the emphasis on the word "new").

May 10, 1979: The Barrier Reef Marine Park Authority chairman (Mr. H. Higgs): "Some areas of the reef would possibly be set aside for mining, but not within the marine park."

May 10, 1979: Mr. Bjelke-Petersen: "No one intends to drill where the reefs are. There are vast areas out beyond the reef where it's safe to drill. It will depend on the tides and current."

"That brings us up to this week, and the ACTU decision to place a ban on drilling, the Opposition's declaration that a future Labor Government would revoke all permits, the Commonwealth - Queensland conference in Sydney, and Mr. Camm's statement that "we want to keep faith with the companies".

In practical terms, the issue now boils down to the extent to which the proposed boundaries of the marine park are to be altered so that oil drilling can occur outside those boundaries — and the extent to which the marine park then covers the reef and reef waters.

In political terms, much obviously hinges on Mr. Fraser.

It is not widely known that when the Government recently decided to ban all whaling in Australian waters, Mr. Fraser was largely influenced by the views of his 13-year-old daughter Phoebe, as representing those of the next generation.

On June 4, Mr. Fraser will have 30 children to breakfast at the Lodge, as an International Year of the Child event.

Maybe he'll get the message there about the Great Barrier Reef.

Oil Exploration Director Comments

Sydney THE SYDNEY MORNING HERALD in English 24 May 79 p 15

[Text] The Great Barrier Reef should be drilled, according to the executive director of the Australian Petroleum Exploration Association, Dr. W. G. H. Maxwell.

He said in Melbourne yesterday that drilling the reef was part of Australia's international obligations. He said Australia could not rely on overseas oil when 10 per cent of its own continental shelf remained unexplored.

But he claimed after APEA's annual meeting that explorers were prepared to accept the majority report of the Royal Commission into Exploration and Production Drilling for Petroleum in the area of the Great Barrier Reef.

The explorers say that the Government has blocked even the operations of seismic or electronic search vessels which might confirm that the barrier reef was totally unprospective for oil or gas.

"Until we know what is there, there is really little point in talking about what would happen if we found something," Dr Maxwell said.

APEA's attitude was made clear because of the political debate over the future of drilling on the reef. The Federal Government has not decided whether it accepts the majority report of the Royal Commissioners.

In a 995-page report they said the hazards by drilling the reef could be reduced to an acceptable degree of risk. There was a small to very small chance of a spill from an exploration blowout though chronic fresh oil spills and leaks of oil would occur from time to time if production went ahead.

Dr Maxwell said that the buffer zones spelled out by the commissioners were acceptable to the oil exploration industry.

They did not allow drilling on existing reefs or islands with sands.

He said there had been no cases of an exploration well blowing out despite 30,000 exploration wells being drilled worldwide since 1967.

"The public is merely hearing the emotive side of the reef argument from ardent conservationists. I'm sure that there would be a more rational approach to the question if the full recom-

mendations of the Royal Commission were published in the media," he said.

In its annual report, APEA says that the results of exploration in 1979 and 1980 will be crucial to Australia's petroleum security for the rest of the century.

On present known crude oil reserves, a shortfall of 120 million barrels in 1980 and of 240 million barrels is reasonably predictable. Should present exploration activity lead to substantial new discoveries the larger shortfall expected for 1990 may well be reduced.

The report says that while technology is being developed in many countries for a wide range of liquid fuel substitutes, it is in Australia's interests to keep a close watch on progress in other countries rather than opting for one particular technology at this stage.

"Such a decision should be taken as late as possible to ensure that Australia has the widest choice of technologies that are now changing so rapidly."

In his chairman's statement, Mr R. M. Charlton says that Australia must distinguish between what is merely technically feasible and what is economically viable in its approach to alternative energy sources.

"Much of the current discussion on energy and in particular on alternative energy sources is unrealistic," he says.

"It does not focus sufficiently upon economics and tends to make over-optimistic assumptions about the feasibility of new technologies and the speed with which they can be introduced on a scale large enough to have any major impact upon current energy supply patterns."

British Scientist's Position

Sydney THE SYDNEY MORNING HERALD in English 22 May 79 p 9

[By Joseph Glascott, Environment Writer]

[Text] A retired British academic, Sir Maurice Yonge, is aghast at suggestions that the Great Barrier Reef might be mined.

Sir Maurice, 78, knows the reef better than many Australians.

In 1928 he led a Royal Society expedition of 12 biologists to study and report on the reef.

It was the first major biological study of the vast reef system.

Sir Maurice, now retired and a Fellow of Edinburgh University, is a former professor of zoology at Bristol and Glasgow universities.

He is in Sydney as a guest speaker at a symposium on molluscs at the Australian Museum, College Street.

"The Great Barrier Reef is the most important and biggest reef structure in the world," he said yesterday.

"It is a very elaborate and complicated ecological system.

"No one can predict what could be the results on the reef of a major oil spillage.

"The possibilities are that the whole reef could be killed or that sections of it could be seriously damaged for many years.

"The damage to one reef near an oil spillage would affect the whole reef system because of the biological inter-connection."

Sir Maurice said the Great Barrier Reef was irreplaceable as a source of study for marine biologists.

"When we came out with our first expedition to the Low Isles off Port Douglas in 1928 the waters around the reef were completely clear.

Covered with sediment

"I was back there last year and found that the isles were covered with sediment.

"Rain forests on the mainland had been cleared for sugar farms and the offshore islands were covered with silt coming from the rivers.

"This shows that the Barrier Reef islands are already under pressure from development."

Sir Maurice said oil spills in waters around Britain and France had shown how serious the effects could be.

A recent tanker disaster had destroyed the lobster and fishing industry of Brittany.

Much more study needed to be done on the effects of oil spills before mining was allowed on the Great Barrier Reef.

Research Study Ordered

Melbourne THE AGE in English 23 May 79 p 3

[Text]

CANBERRA. — A top level marine science committee has been asked to outline the level and form of research needed before a decision can be made on oil drilling on the Great Barrier Reef.

The Australian Marine Sciences and Technologies Advisory Committee has been asked to provide advice on a research programme so funds can be allocated in the Federal Budget.

The committee, chaired by Professor A. J. Birch, will meet today to prepare a submission on the

size and scope of the research programme.

The submission will be put to the Australian Science and Technology Council, which will then make recommendations to the Prime Minister, Mr. Fraser.

Mr. Fraser yesterday said the programme would advance the cause of the preservation of the reef.

He reaffirmed that the Government would not allow any drilling or mining in the area which would do anything to damage the reef.

"If there is doubt about whether an activity would dam-

age the reef, that activity would not take place," he said.

Professor Birch said the committee had been collating material on the marine science and technology needs of all coastal areas, but was treating the reef as a very urgent priority.

"It may be that oil drilling will produce no damage at all, or it could be totally devastating," he said.

"The point is that not enough information exists at the moment to make a firm statement."

Professor Birch said the research programme could take three or four years to complete.

Government's Intentions Questioned

Melbourne THE AGE in English 29 May 79 p 11

[Editorial: "Evasion on the Barrier Reef"]

[Text]

IN recent days the oil industry has begun to step up its campaign to persuade the Federal Government to allow exploration on or around the Great Barrier Reef. One leading oil industry spokesman suggested that Australians would "demand" oil exploration in the reef's waters by the end of the year; while the annual meeting of the Australian Petroleum Exploration Association last week went even further, agreeing that Australia had an "international obligation" to drill on the reef. What is disappointing about both statements is not their commercial self-interestedness, but that the Federal and Queensland Governments should not see fit to put the oil men firmly in their place. Instead, both Governments remain equivocal and evasive on the question, either refusing to declare themselves when asked, or resorting (like Mr. Fraser's Ministers) to a series of vague, general and conflicting statements that can only leave the public baffled.

As the 1970-74 Royal Commission made clear, there are two separate but related issues at stake. One is drilling on the reef itself; the other drilling in the waters surrounding it. The Royal Commission was emphatic that there should be no drilling on the reef itself. But the commissioners were divided over the question of drilling in the waters adjacent to it, and the dangers (in the form of "blowouts" and oil spills) that such drilling might present. It is this uncertainty which the oil industry — in the context of world oil shortages — is currently seeking to exploit. It hopes to persuade the

Government to renew the six petroleum exploration permits suspended in 1971. If the permits were granted, there seems little doubt that the exploration companies would find the Queensland Government helpful and co-operative. For while the Premier, Mr. Bjelke-Petersen, and his Mines Minister, Mr. Camm, have ruled out drilling on the reef proper, they have also said there were other places in the region where drilling was "a possibility" or where it could be carried out with safety.

This is not the public view. A recent AGE POLL showed that 66 per cent of Australians (and 69 per cent of Queenslanders) thought no drilling on or near the reef should be allowed. Implicit in such a view is probably the notion, that, as the Royal Commission said, the Great Barrier Reef is "part of the world heritage", that it belongs not just to Australia but to the world, and that we are duty bound as such to do everything that we can to preserve it. This is a duty which far transcends the duty which the oil industry claims we have to look for oil in our own waters, and it is time the Fraser Government said so. It is also time the Government proclaimed the reef as a marine park, as Parliament said it should do back in 1975. Until it does, the public has every right to be suspicious about the Government's motives and intentions.

AUSTRALIA

PERTH CONSERVATIONISTS PROTEST PLANNED BAUXITE STRIP MINES

Melbourne THE AGE in English 29 May 79 p 3

[From Jan Mayman]

[Text]

PERTH. — Police arrested 28 conservationists at a demonstration against a proposed \$800 million bauxite refinery at Wagarup yesterday.

The members of the West Australian Campaign To Save Native Forests face \$1500 fines or 18 months' jail under a section of the WA Police Act banning obstruction of State-approved projects.

Three of the demonstrators were knocked to the ground when they tried to stop a bulldozer at the refinery site.

No one was injured.

The arrests followed the weekend occupation by demonstrators of the Alcoa site, 140 kilometres south of Perth.

Police moved in at noon after telling demonstrators they were obstructing a State-authorized project.

A spokesman for the Campaign To Save Native Forests, Mr. Neil Bartholomaeus, said the protest was to protect native forests against "the juggernaut alumina industry".

"We believe the alumina industry has ~~greater capacity~~ to cause unemployment than employment because it squanders vital energy resources," he said.

The West Australian Government has given approval to mining companies to clear about 300 hectares of the State's unique jarrah forests to strip mine bauxite.

The mining proposals have been met with opposition from conservation groups and CSIRO scientists who claim that bauxite mining in the forests near Perth could increase salinity in the city's water supply.

The jarrah forests of the Darling Ranges at Wagarup are Perth's major water catchment area.

But WA's Premier, Sir Charles Court, has said the refinery construction would boost the State's flagging job opportunities.

Alcoa spokesman, Mr. Geremy Rush, said the company had no alternative but to call in police once its work had been obstructed.

OIL REFINERY SEEN AS THREAT TO TAJ MAHAL

Kuala Lumpur BUSINESS TIMES in English 7 Jun 79 p 2

[Text]

A GROUP of Indian environmentalists demanded this week that the government shift a nearly completed oil refinery because of a possible pollution threat to the Taj Mahal, other historic monuments and a bird sanctuary.

"The question is no longer whether the Mathura refinery will harm the Taj Mahal and other nearby monuments, but how long will it be before the acid fumes make the damage visible," they said in a statement issued here.

The group, led by noted bird expert Dr. Salim Ali, cited reports by Indian and foreign scientists which claimed the state-owned refinery posed a potentially great danger to the Taj, monuments in the Braj Mandal area and the Bharatpur bird sanctuary, all downwind of the refinery.

Persons living near the 337-year-old Taj, about 40 kilometres southeast of the refinery, report that the famous marble mausoleum has already lost much of its pearly sheen because of pollution-emitting iron foundries in the vicinity.

Experts fear the monument will further deteriorate because of the sort of acidic effluents thrown into the air by refineries which can corrode marble, causing it to flake.

The government has said that all precautionary measures were being taken. However, some officials privately

have admitted a risk of further damage remained.

Ali, 63, considered India's leading bird expert, is president of the Bombay Natural History Society and the author of a number of books on wildlife. The other three are Kisan Mehta, a Bombay environmentalist, Murad Pyzee, a member of the National Travel Agents Association and industrialist S.P. Godrej, who is a prominent member of the Indian chapter of the World Wildlife Fund.

In May, a parliamentary committee requested the government to consider relocating the most polluting units of the US\$250-million refinery. However, no estimates of the cost of shifting all or a part of the facility has been made public.

The refinery is being built to meet growing energy needs in North India.

Braj Mandal, an area surrounding Mathura, is revered as the birthplace of the Hindu god Krishna. Many monuments to the Hindu god are found in the area.

The Taj was built by the 17th century Moghul emperor Shah Jahan to house the jewel-encrusted tomb of his second and favourite wife Mumtaz Mahal from whom the name Taj Mahal is derived. It took 22,000 craftsmen 22 years of labour to complete the edifice. — AP

FARMERS SEEKING COMPENSATION FROM JAPAN-INDONESIA PLANT POLLUTION

Jakarta KYODO in English no time given 18 Jun 79

[Text] Jakarta 18 Jun KYODO--Indonesian farmers at Semarang in Central Java are seeking 120 million rupiah (yen 40 million) in compensation from a Japanese-Indonesian joint venture they claim has damaged rice fields and fish ponds by discharging industrial wastes with practically no controls.

"Ammonia in the chemical wastes has destroyed our rice harvest for the past two and half years," a farmer said. "It abnormally accelerates growth of the grain."

The farmers said some 60 hectares (150 acres) of paddy fields have become irrecoverably barren since Semarang Diamond Chemical, a producer of citric acid from cassave for use in soft drinks, started operations in 1977.

The chemical plant, the farmers say has turned 90 hectares of fish ponds into holding reservoirs for wastes in what is termed the most sensational industrial pollution case in the country.

With the loss of farmland and fish ponds, some 300 farmers near the chemical plant now make their living as day laborers. Their daily earnings are 300 rupiahs (yen 100) or less, they said.

"It is roughly half what we made from farming the land," one of them added.

The chemical firm has also made water near the plant undrinkable and nearby residents have to go to a village 500 meters away for water.

Faced with rising protests from the residents, the company installed equipment in May to curb the water pollution.

But wastes from the plant are still polluted 70 times more than the maximum level set by city authorities of Semarang, which has a 1.3 million population.

"The aerator is not working as it should," city officials said.

In response to the 120 million rupiah damage claim, the chemical firm has offered 5 million rupiahs, contending that there is no positive evidence to show the damage was caused by the wastes.

Shinzo Takahashi, a Japanese executive at the chemical firm, said, "There was no pollution control regulation to follow when we started operations in 1977."

"It only came into force in 1978," he added in an apparent disavowal of company responsibility for the alleged environmental destruction.

The firm is jointly operated by Indonesian-Chinese businessmen, a Tokyo chemical company and Mitsubishi Corp, the giant trade house based in Tokyo.

CSO: 5000

OVER 80 PERCENT CONSIDER SELVES VICTIMS OF AUTO POLLUTION

Tokyo KYODO in English no time given 5 Jul 79 OW

[Text] Tokyo, 5 Jul (KYODO)--More than 80 per cent of the people questioned in an Environment Agency survey believe they are victims of automobile pollution.

The agency said Thursday it sent questionnaires to 500 persons chosen as "environment monitors." Of the 500, 489 replied and 296 of the respondents, 59.2 per cent, owned a car.

Traffic accidents were identified as the most serious automobile problem (23 per cent), followed by air pollution from exhaust emissions (23.5 per cent), traffic congestion (21.7 per cent), auto noise (17.4 per cent), and energy waste (9.5 per cent).

Asked whether they are affected by air pollution, noise and vibration caused by automobiles, 55.4 per cent replied "a little" and 26.6 per cent "considerably." In all, those who believe they are being affected by automobile pollution exceeded 80 per cent.

Of the respondents, 58.7 per cent said automobile pollution had worsened since five years ago, but 77.8 per cent of those living in business districts said the pollution had worsened in the past five years.

More than 67 per cent said they believed the situation would become worse in the future.

An overwhelming 94.1 per cent favored stricter antipollution steps concerning motor vehicles, while only 4.3 per cent said the present measures are enough.

Of those favoring tighter antipollution measures, 30.5 per cent listed restricting auto traffic volume and expanding public transportations.

Other steps suggested were increased production of low-pollution cars (25.8 per cent) and improvement of road conditions (15 per cent).

However, there seemed to be a difference in outlook between those owning cars and nonowners as replies to the following questions revealed.

Asked whether they thought automobile pollution has worsened, 63.7 per cent of nonowners said "yes," compared to 55.4 per cent of the car owners.

Also, 97.4 per cent of nonowners and 91.9 per cent of owners favored stricter antipollution measures, but almost all except those driving almost daily gave top priority to "restricting traffic volume" to reduce pollution. Those who use cars almost every day listed "production of low-pollution cars" as the best way to prevent vehicle pollution.

CSO: 5000

BRIEFS

SEASONAL RAIN DAMAGE--Tokyo, 3 Jul (KYODO)--Heavy seasonal rain in the southern part of the Japanese Archipelago caused serious damage on Kyushu, Shikoku and smaller western islands during the week that ended Monday, Shiro Nakano, director general of the Land Development Agency, announced Tuesday morning. The heavy precipitation caused heavy casualties, including 28 persons dead or missing and 50 injured in the week between June 26 and July 2, Nakano said. Tuesday's semiweekly cabinet meeting heard a report from Nakano on the rain damage, which was concentrated in Kyushu, particularly Kumamoto, Saga, Fukuoka prefectures. Buildings destroyed numbered 133, and those inundated 87,000, according to Nakano. The Agriculture, Forestry and Fisheries Ministry said damage to crops by the week-long rainfall was estimated at Yen 23 billion. Some 64,000 hectares of farmland was affected, it added. [Text] [Tokyo KYODO in English no time given 3 Jul 79 OW]

CSO: 5000

PALM OIL INDUSTRY IS KILLING THE RIVER SYSTEMS

Kuala Lumpur BUSINESS TIMES in English 7 Jun 79 p 14

[Article by Joe Fernandez]

[Text]

FROM time to time the Malaysian environmental lobby reminds its fellow citizens that the existence of a large agricultural sector does not diminish the prospects of environmental pollution.

But the general misconception dies hard. The usual response from most government officials and the average, generally uninformed citizen: "There is still plenty of open country, fresh air, pure water, clean sandy beaches, hunting grounds in season fishing, etc. You name it, we have it, both here and in East Malaysia. We should concern ourselves with prevention, not cures."

By even most Third World standards, agriculture is an important element in Malaysia's economy. According to the mid-term review of the Third Malaysia Plan (1976-80), the sector's contribution last year was 20.0 per cent to the Gross Domestic Product (GDP) and 44.0 per cent in total employment. Acreage-wise, oil palm maintains its new lead with 1.9 million acres, followed by rubber and rice with 1.36 and 1.08 million acres, respectively.

Coconuts, pepper, cocoa, timber, tobacco, fruits, vegetables, pineapples, sugarcane and tea are other primary activities.

A high rate of waste production is often the end result of the country's organised agricultural sector. Most of it flows untreated into local river systems despite the existence of the

"Environmental Quality Act 1974." The reasons are not hard to find either. As explained by a Department of Environment (DOE) official: "Agricultural producers are chary of adopting waste-recycling methods, fearing both the expense involved and the effects on profitability."

Often the dilemma is viewed in simple black-and-white terms as one of "economic development versus the environment issue."

Meanwhile, the oil palm industry is literally killing the Malaysian river systems. Conservative estimates by the Environmental Protection Society of Malaysia (EPSM) indicate that three to four million tons of effluents are discharged by the country's 86 palm oil factories. The effluents carry both organic and inorganic solids, oil, etc. all with the potential to absorb oxygen from the rivers.

Waste-heat from boiler blowdown, condensed water and steam traps, though "non-polluting", presents another dimension to the environmental issue. This is because waste-heated water is channeled into the river-systems at temperatures of 30 degrees C and more. Ob-

serves Gurmit Singh, president of the EPSM: "If this is a continuous process, it is enough to disturb the biological equilibrium of the rivers seriously. The discharge water being acidic (pH 4-5) further aggravates the situation."

Other observations on waste discharge and the environment made by the EPSM:

• The oxygen-depleting qualities of organic waste acids, they often carry toxic ammonia and hydrogen sulphate, both inhibiting to biotic life. Excessive quantities of phosphate and nitrates (from field fertilisers) are stimulating plankton and floating plants. The resultant choke of the river-systems is reducing photosynthesis, leading to smaller schools of fish.

• Only a small part of the pineapple goes into the can, the rest being cast into the river to pollute the waters. No attempt is being made to convert pineapple waste into animal feed or other useful by-product.

• Industrial pollution is mostly one of gases discharged from factory stacks and toxic matters in effluents. The most common air pollutants

are nitrogen gases, sulphur dioxide and dust. The most common effluent pollutants are mercury and cadmium.

• Routine tank washings and oil spills in the Straits of Melaka and the South China Sea threaten the destruction of the mangroves. The mangroves play an important part in the biological process of food production for fish, a staple diet in the country.

In a recent study of the river-systems of the Klang Valley region, the EPSM came up with several interesting conclusions. Speaking of the Kerayong River, the study says: "The results show that the river is very polluted. At times there is no oxygen in the river. The biochemical oxygen demand (BOD) was also very high, reaching 88 ppm on one occasion. The river has a foul smell all the time and the smell is of domestic sewage."

On the Penchala River, the EPSM study notes: "No dissolved oxygen was detected at any time. The BOD is also very high with an average of 106 ppm. The river is quite black and the smell of hydrogen sulphide can be detected from quite a distance. The river drains the whole of Petaling Jaya and carries considerable quantities of industrial wastes together with septic tank effluent. The

river in every sense of the word is dead."

Still, there is a limited amount of waste disposal/recycling in Malaysia. The main areas of activity at the moment are municipal waste, waste from wood processing, and oil palm waste from some big producers.

The DOE estimates that nearly 8.7 million tons of municipal waste are collected and disposed in Malaysia annually. In 88 per cent of the cases, local authorities use the "open-burning" method, which results in particulate matter, odour and toxic fumes. A rough DOE guess indicates that 80,000 tons of particulate matter and 26,800 tons of acid gases are emitted in these cases. Value-recovery losses is estimated at M\$10.5 million per year.

Waste disposal in the wood-based industries is also through open burning and incineration. Last year, the DOE reckoned that approximately 800,000 tons of wood waste was recovered as fuel for boilers and kilns. A further two million tons was lost by just burning away. It is estimated that the energy-recovery from the two million tons would be sufficient to cook rice for the whole

year in Malaysian homes. Timber industry sources say that serious considerations are in hand to recycle waste-wood into chipboards.

Certain sectors of the oil palm industry have a more successful record in waste recovery and utilisation. The usual method is to burn the

waste bunks in incinerators. The potash recovered is utilised as fertiliser. The Malaysian Oil Palm Producers Association (MOPPA) estimates the value-recovery at M\$11.5 million per year.

Most of the oil palm fruit's shell and fibre is used by the industry for steam generation. One drawback is that the boilers currently being used produce heavy emissions of particulates. They are also designed to operate at a low rate of thermal efficiency to deal with excess fibre and shell loads. This is said to lead to a smaller disposal problem. At full potential the MOPPA estimates that the energy recovered could be three times last year's rate of 118×10^6 kwh. This could help to solve the pressing need for electrification in the nearby rural villages.

Waste-recycling is still a recent phenomenon in Malaysia because of the lack of technology. Sometimes, as in the case of biogas and sewage waste recycling, there is the added problem of social stigma. Remarks Tan Sri Ong Kee Hui, Minister for Science, Technology and Environment: "As a developing nation it would be to our great advantage to recycle wastes into useful products — for example, municipal garbage and sewage into fertiliser. Cullet (waste glass), paper, and even plastics can be recycled into use. We must try to transfer such technologies to Malaysia and adopt them for our own use."

— Depthnews.

OCEANOLOGIST SAYS NUCLEAR POWER PLANT POLLUTION DAMAGES FISH, PLANKTON

Seoul THE KOREA HERALD in English 28 Jun 79 p 8

[Text] Thermal effluent from the Kori Nuclear Power Plant and the Yosu Thermal Power Plant have caused some 40-60 percent mortality of plankton and some 60 percent of other small fishes including larvae living in the seas near the plants, Dr Huh Hyung-tack of the Korea Ocean Research and Development Institute said yesterday.

In his paper to the Korea-U.S. joint advisory meeting on marine biology, being held at the Korea Institute of Science and Technology in Seoul from Tuesday, Dr Huh said, the Kori plant utilizes some three million tons of sea water daily to cool its nuclear reactor and discharges it in the nearby sea.

The figure is more than twice 121 tons, the maximum amount of water consumed by all Seoul citizens daily.

His study since August, 1978, at the two power plants revealed that the distribution of ambient water temperatures ranged from about 22 to 29C (72 to 84F) during August and September, 1978, and from 12 to 13C (54 to 57F) during January through April, 1979. The temperatures of discharged waters were between 18C (64F) in February and 35C (97F) in August.

Dr Huh said the data showed that the impacts of heated effluents from both power plants were not profound enough to significantly affect the distributional patterns of aquatic organisms in the study areas.

However, around 1990 when the nation is expected to have about two dozen power plants, mainly nuclear, some 2,000 million tons of sea water will be utilized daily, which will certainly affect the coastal ecosystems and thus cause some changes to a certain extent in the inshore fisheries including mariculture, the marine biologist claimed.

Besides the great reduction of zooplankton populations, larvae and other fishes were also killed during passage through the cooling systems of the power plants, said Dr Huh.

Dr Huh said the number of larvae going into the intake system was estimated to be about 1-6 per second and it increased in June to a maximum of 453.

Though the mortality rate of entrained larvae was not clearly determined, if we assume a 100 percent mortality of entrained larvae, a considerable number of larval fish would be killed.

CSO: 5000

SOUTH KOREA

SURVEY SHOWS MERCURY POLLUTES RICE ACROSS KOREA

Seoul THE KOREA HERALD in English 30 Jun 79 p 8

[Text] The government confirmed that all the rice cultivated in Korea is polluted with mercury, a harmful heavy metal.

According to the results of a survey recently conducted by the National Institute of Health, the National Environment Research Institute and the Agricultural Technology Research Institute, rice samples collected in Kyongsang Pukto were found to contain 0.00825 ppm of mercury followed by 0.007 ppm from Kyongsang Nampo, 0.0068 ppm from Cholla Nampo, 0.00586 ppm from Kyonggi-do and 0.0055 ppm from Kangwon-do.

The survey said that rice cultivated in the Chungchong-do area was found to be least contaminated. It said it detected 0.00514 ppm of mercury in the rice from Chungchong Nampo and 0.005 ppm from Chungchong Pukto.

Officials said the mercury contamination in the country is not a serious matter at the moment as the figures were much lower than the permissible level, 1 ppm, in Japan. The figures have been on decrease annually, they said.

However, considering the fact that the government banned the use of agricultural chemicals containing mercury in 1977, the survey showed how seriously chemicals contaminated farm land and crops, specialists said.

Another similar survey by the Korea Atomic Energy Research Institute revealed that the rice in the country was contaminated by an average of 0.053 ppm of mercury.

CSO: 5000

BRIEFS

CONTAMINATED SEOUL DRINKING WATER--Seoul June 22 OP-KYODO--The eight million residents of this city are drinking water heavily contaminated with various pollutants, a research team from Seoul National University revealed Friday. Prof Hong Sun Woo of the university's Microbiology Department studied the suitability of the Han River's drinking water from June 1977 through May 1978 at seven places along the lower part of the river, which is the only drinking water source for Seoul citizens. Hong said he found that the biochemical oxygen demand ranged from 0.35 PPM to as much as 253.08 PPM--far above the six-PPM level designated as acceptable by the World Health Organization. Contamination by synthetic detergents was reported to be 0.55 PPM at most at Kayang-Dong, just above the WHO's permissible level of 0.5 PPM. The average contents of manganese and copper in the Han River water were 0.058 PPM and 0.065 PPM, respectively, a higher level than in rivers in Japan, according to the study. Contamination with chrome was reported to be 0.005 PPM, only one-tenth of WHO's permissible level of 0.05 PPM, but it was nine times heavier in the lower part of the river than in the upper part. Hong said that water in the lower part of the Han River is unsuitable for drinking or even for industrial use. [Text] [Tokyo KYODO in English no time given 22 Jun 79 OW]

CSO: 5000

EDITORIAL EXPLAINS LEGAL STATUS OF ENVIRONMENTAL PROTECTION

Prague RUDE PRAVO in Czech 20 Jun 79 p 4

[Article by Doc JUDr Zdenek Madar, CSc, CSAV [Czechoslovak Academy of Sciences] Institute of State and Law: "Living Environment and Laws"]

[Text] A large number of RUDE PRAVO readers deal with the problems of environmental protection. Engr Vladimir Barta for example writes: "I think that if our laws on environmental protection were consistently observed, we would serve as a model for the entire world." Josef Vojtik, on the other hand, asks whether a law on environmental protection is being prepared.

In recent years, all socialist states have passed legislation which aims to legally regulate environmental protection to meet modern, contemporary and future needs. In the CSSR for example, completely new regulations have been enacted in recent years for protection of water resources, forests, territorial distribution and quality of construction projects, protection against noise and vibrations, and the existing regulations have been amended or updated on care for people's health and protection of land. In addition, work is in progress on the new regulation of care for cultural monuments and on the principles of new regulation of protection of nature and so on. Likewise control has been enforced over the observance of socialist legality in this area striving for consistent respect of legal provisions regulating environmental protection.

There is also a noticeable tendency, however, to formulate the regulatory measures on environmental protection in more comprehensive terms than ever before. In the USSR for example, the principles of legislation have been approved in the area of health care, administration of water resources, utilization of mineral wealth, forestry and so on.

Some socialist states have likewise drafted laws regulating in general terms the entire environmental protection by the socialist state. Such a law was drafted in the GDR in 1970, in Romania in 1973, in Hungary in 1976, while a draft of such a law is being discussed in Poland and work on such a bill is in progress in Bulgaria now. In the USSR, the Institute of State and Law of the USSR Academy of Sciences works on the scientific fundamentals of a comprehensive regulation of environmental protection. In the CSSR, a 60-member

comprehensive rationalization brigade at the Institute of State and Law of the Czechoslovak Academy of Sciences works on the legal and political principles of environmental protection. Some CEMA documents recommend the drafting of a comprehensive general law on environmental protection.

There is also a definite tendency to improve the organizational structure of environmental protection particularly in two main directions.

There is an emphasis on more effective coordination efforts aimed at central environmental protection. In the USSR for example the coordination of efforts aimed at environmental protection has been entrusted on the all-union level to a separate department of the USSR State Planning Commission, while in Hungary, Romania and Bulgaria national councils have been established for environmental protection which are attached to the councils of the ministers of the republic in question. In the CSSR, a Council for Environmental Protection in the CSR government, as SSR Government Council for Environmental Protection and the CSSR government Commission for environmental problems have been set up.

Furthermore, efforts are being intensified to achieve environmental protection also on the local level, that is on the level of krajs, okreses, towns and other communities. Commissions for environmental protection have been established in local representative organs in all socialist states.

In view of the overall importance of environmental protection, this activity (in addition to economic, organizational function and cultural education and so on) is beginning to be recognized as an independent and permanent function of the socialist state.

10501

CSO: 5000

HUNGARY

'MASS' PHOSGENE POISONING REPORTED

Budapest ESTI HIRLAP in Hungarian 5 Jul 79 p 8

[Text] Workers of the ancillary plant of the Magyar - Bolgar Baratsag (Hungarian-Bulgarian) Agricultural Producer Cooperative located near Pestertsebet [an outskirt of Budapest near Csepel Island] in the Rakerv District of Pest County were emptying gas flasks and then subjecting them to pressure tests yesterday. They failed to follow regulations and were working without permission. They emptied 60 gas flasks simultaneously. The gas rose to height of 4-5 meters and the wind carried it in 40-meter wide band, like a mist, in the direction of the model farm operated by the Horticultural University in the Dabas District of the county where children were working along with adults. Ambulances were called when the first symptoms of poisoning became apparent; the attendants took 8 children and 13 adults to the hospital where they were found to be suffering from mild poisoning. At present, they are under observation at the hospital.

So far, it has been established that the flasks contained phosgene gas used by pharmaceutical plants. Police experts are participating in the investigation to determine those responsible for the event.

CSO: 5000

MERCURY POLLUTION CAUSES CONCERN

Caracas ULTIMAS NOTICIAS in Spanish 24 Jun 79 p 8

[Text] Valencia, 23 June--The founder of the Valencia Health Unit, Dr Manuel Salvador Barreto Lima, who is also an eminent Carabobo health specialist, has warned the authorities of the Carabobo State Commissioners' Office of the mercury pollution in the coastal areas of Moron, Tucacas, and other surrounding regions.

The health specialist told the journalist, who had learned of the problem from the press, about the serious situation posed by the pollution of seawaters by mercury waste from petrochemical industrial plants.

"That is," he said, "in the coastal areas of Moron, Tucacas, Boca de Aron, etc. As a result, I feel that the report on this subject published recently by the Venezuelan Institute of Scientific Research and signed by biologist Juan Urich should be given all the attention it deserves as a matter of urgency. At present, among other scientific health data of invaluable significance, there is the proven fact that 'chipichipes' and other shellfish of the area are contaminated by mercury, a toxic element which is threatening vertebrate and invertebrate animals with disease and death, principally man and aquatic fauna, with the economic consequences such a situation entails."

Dr Barreto Lima produced an article which had appeared in a capital newspaper (EL UNIVERSAL) dated 4 April 1970, page 28, which was the first account of a tragic death in Japan attributable to the eating of fish contaminated by mercury wastes in polluted waters, a country where there are still hundreds of persons victimized by cruel and irreversible ailments as a result of poorly controlled industrial development.

"This, without a doubt," Dr Barreto continued, "is a bitter experience which we should take as an example of the civic responsibility of all those who in one way or another have anything to do with health or who had anything to do with it, as is my situation. That is the reason for these statements and warning in the face of the distressing and serious health problem in Carabobo which also has an impact on the waters of the coast and bordering states."

Dr Barreto Lima pointed out that the above-mentioned newspaper had commented that with the same gradualness with which mercury was introduced into the sea "the disease has been making its appearance," making it worth knowing how the "filling of the electrolytic cells of the respective Moron petrochemical plants is accomplished."

In a related matter, the first meeting of the national toxicological network was held recently in the city of Caracas. The agenda dealt with poisonings from high risk pesticides and snakebites and other worthwhile toxicological subjects in general. However, surprisingly, according to the agenda, there was no consideration of the now "extremely serious" problem of mercury pollution of waters which we have been describing and which should have been an opportune time for discussion.

Our distinguished health specialist continued, "I recognize that there are advanced studies and scientific investigations now in existence which have resulted in a real and very extensive decrease in the epidemiology of infectious diseases; however, today, because of other social ambiances and accelerated industrial progress, new epidemiological problems are arising in which man and his family are necessarily the focuses of constant study. From this derives the fact that the problem of mercury pollution of sea-waters is one of the many which the Ministry of Health, without loss of time, openly and decisively must confront with advanced and sure studies commensurate with their social importance."

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CSO: 5000

HARMFUL EFFECTS OF DDT DEPLORED

Salisbury THE HERALD in English 9 Jul 79 p 4

[Article by Cheryl Robertson: "DDT May Silence the Fish Eagle Forever"]

[Text] The haunting cry of the fish eagle as it soars across Lake Kariba is one of the most beautiful sounds of Zimbabwe Rhodesia.

It epitomises Africa.

However, according to Mr Ron Thomson of the Department of National Parks and Wildlife Management, fish eagle and other birds of prey will become extinct within the next 10 years, due to the persistent use of pesticides in agriculture.

This has happened to the peregrine falcon in the United States and is still affecting the American bald eagle which is in decline despite the banning of DDT in that country in 1972.

He said that for some years the department had been examining the pesticide residue in birds' eggs from all over the country.

The results showed that peregrine and lanner falcons, fish eagles and black sparrowhawks' eggs were highly contaminated with DDE.

(DDT breaks down into DDE then TDE--DDE being the dangerous substance.)

In a recent visit to the United States Mr Thomson discussed the results with Dr Tom Cade, Professor of Ornithology at Cornell University.

Professor Cade said that the level of DDE in the female influenced the eggshell formation: the higher the DDE residue the thinner the shell, resulting in breakages of eggs or their failure to hatch.

He said that different species of birds had different sensitivities to DDE.

Wide Losses

"If DDT continues to be used at current rates of application in Zimbabwe Rhodesia you can expect to see widespread egg losses and population declines in these and other 'top of the food chain' species in a few years," he said.

Mr Thomson said: "In view of the expansion of the cotton industry into tribal areas where DDT is likely to be the principal pesticide used, I believe he is right."

He said he had not yet found a scientifically orientated person or organization who had fully grasped the seriousness of the situation. Some were not really interested.

Mr Thomson said that many "upstanding citizens" had stated that it "matters little to man if he destroys wild things so long as he can clothe his body and fill his belly."

"There is no need for such apathy because there are alternatives to DDT which are not harmful to the environment when handled, stored and used correctly, and if there is an added cost, is this not the price we have to pay for a healthy environment?"

He said it was also used for tsetse fly and malaria mosquito control. In the case of tsetse fly control, the government was already aware of the environmental problems involved and other methods were continually being investigated.

He said the city dweller also contributed to the problem by using DDT in the garden.

"This virtually indestructible chemical finds its way down our river systems to Kariba, polluting everything along the way," said Mr Thomson.

DDT is absorbed in the fatty tissues of animals and accumulates at the end of food chains.

According to his analysis chart in which the results of 44 samples from all over the country were tabulated, even a day old domestic chick from the Salisbury area had measurable quantities of DDT in it.

The results show that practically every egg contained some measure of DDE.

A spokesman from the Ministry of Health said that some pesticides had to be persistent. Soil treatments for termite control were useless unless they were lasting.

"Indoor spraying for malaria will fail unless each treatment lasts for a month and preferably longer," she said.

She said these treatments had little or no effect on wildlife.

A report issued last year by the World Health Organisation stated that many developed countries had restricted or banned the use of DDT except when it is needed for the protection of health.

Of underdeveloped countries, the report said: "If DDT were not used, vast populations would be condemned to the ravages of endemic and epidemic malaria."

The reason for this statement, the spokesman said, was that substitution of other suitable pesticides for DDT would vastly increase the cost of malaria control, which many underdeveloped countries could not afford.

"I think more attention has been given to the organochlorine compound DDT than any other pesticide as it was the first to be used extensively throughout the world.

"There are other organochlorine pesticides used in this country which, like DDT, remain in the soil for many years, and some are more toxic than DDT," she said.

Less Threat

She said other toxic pesticides were used in agriculture but these generally broke down rapidly in the soil and posed less of a threat to wildlife than the organochlorine pesticides.

"The misuse of any pesticide can be injurious to wildlife," she said.

A spokesman from the Ministry of Agriculture said that the situation certainly had to be watched, but "we must not be carried away with emotion."

"We must evaluate one against the other. Either there is abundant food and possibly a die-off of birds of prey, or we starve."

He said that since the early 1970s the use of DDT in agriculture has been reduced drastically, and is registered for use only in cotton.

He felt Mr Thomson's results were too fragmentary and based on insufficient evidence.

"No one wants to see rare animals become extinct, but the true picture cannot be gained from a handful of samples," he said.

Dr John Phelps, lecturer in the zoology section at the University of Rhodesia, said that Mr Thomson and the Department of National Parks and Wildlife Management would have a very valid argument if he had more evidence.

"His results seem insufficient as only a few eggs were examined. In 1978 the level of DDT in cormorants at Lake McIlwaine for example, had not changed drastically from samples taken in 1974," he said.

"The level of DDT in the birds could now be at a plateau and could either rise or fall. This is what Mr Thomson must determine.

"Everyone knows the importance of the preservation of wildlife, but there is no use going overboard when there may not be a problem.

"I suggest the department monitor many more samples on an annual basis so we can see if the level of DDT in the birds is really increasing.

Lack of Time

"The whole ecological system of a water body, from sediment to the birds of prey, should be examined to find where the level of DDT is highest."

He said that the population of fish eagles in the Matusadona hills were "at a satisfactory level" at present.

Endosulfans could be used as an alternative, he said but they were highly toxic and could harm unsophisticated persons using them. They were also more expensive than the organochlorines and killed only certain pests, not all.

In reply to these statements Mr Thomson said: "We do not have time to be complacent. People not familiar with the problem, or not directly concerned, may believe we have time to indulge in academic studies.

"The fact is that although we have only 44 samples every one of them shows significant levels of DDT and its metabolites.

"As Professor Cade pointed out, the results from fish eagle and falcon eggs clearly show that we are already half to three-quarters way down the threshold beyond which the population will collapse.

"If we do not heed what the experts say from those countries who have already experienced the full results of the problem, then we have no right to classify ourselves as a forward thinking enlightened and civilised nation."

CSO: 5000

ACTION AND PLANS TO PRESERVE ENVIRONMENT

Moscow LITERATURNAYA GAZETA in Russian No 14, 4 Apr 79 p 11

[Article by A. Udal'tsev]

[Text] In the past year the USSR State Committee for Hydrometeorology and Environmental Control has been created in our country, and the decree of the CPSU CC and the USSR Council of Ministers "On additional measures to intensify natural conservation and improve the use of natural resources" was published quite recently. The conversation of our special correspondent A. Udal'tsev with the chairman of the committee, corresponding member of the USSR Academy of Sciences Yu. Izrael', was devoted to these events.

[Question] Yuriy Antoniyevich, let us start at the beginning. Until recently you headed the Main Administration of the Hydrometeorological Service under the USSR Council of Ministers, and today you are chairman of the new USSR State Committee for Hydrometeorology and Environmental Control. The same working office, the same building on Ulitsa Pavlika Morozov, the same associates... What new tasks face the recently formed committee?

[Answer] I will speak first not about what is new, but about what formerly was. Although you have rightly said that the Main Administration of the Hydrometeorological Service already does not exist, the tasks of the hydrometeorological servicing of the national economy remains one of the main and basic tasks of our new committee. We must as before obtain information about the natural state of the surrounding natural environment (and as completely as possible!), use that information in the interests of the national economy, prevent unfavorable changes of the state of the natural environment or, on the contrary, contribute to the use of the favorable state in the interests of the national economy.

Thus the first area of our work has to do with problems of hydrometeorology that are related to changes of the state of the natural environment caused by natural factors. I have in mind changes of temperature, pressure, of the quantity of precipitations, of cloudiness--we must find out about them and warn the population in time.

However, in recent years changes of the state of the environment caused by human activity have arisen in the world, including the Soviet Union. Contamination and the great dangers connected with it are one example of such changes. I will name further destruction of the soil cover during the extraction of minerals, which requires recultivation. One can also cite other examples of anthropogenic effect (that is, human effect) on the environment. Thus a purpose new in principle for the work of the USSR state committee is monitoring the state of the natural environment in the broadest sense of that concept and primarily monitoring contamination.

But not just monitoring, not just obtaining information, but also action (such as causing additional precipitation, the struggle against pests, the dispersal of fogs, etc). We must at least try to actively affect the natural environment and hydrometeorological processes in the interests of the national economy of the country.

[Question] But to have an effect it is necessary first of all to find out about the state of the environment. Do we have such knowledge?

[Answer] A special statewide service for observation and monitoring of the level of environmental contamination has already been functioning in the country for several years. On the basis of our data the party and soviet organizations and various ministries and departments are adopting effective measures directed toward reduction of contamination and improvement of the state of the natural environment. But in large industrial centers harmful emissions from various sources are rapidly interspersed, and on the basis of that information it is difficult to determine those sources, those specifically guilty of contamination. A new duty of our committee is to find those sources. In the very near future, together with other departments, we must prepare standards of allowable emissions of contaminants. I am speaking especially about the air, the main danger is there.

That work has been started and an All-Union State Standard has already been discussed and adopted on rules for the establishment and calculation of allowable emissions into the atmosphere. Now, together with interested departments, we must establish emission standards for enterprises of various regions.

They must be based on the need for observance of high quality of the environment and must take into consideration the technological possibilities of industrial enterprises and other sources of contamination.

[Question] Will those standards be identical for all rayons, cities and industrial enterprises?

[Answer] No, since much will depend on the meteorological conditions and terrain, on the character of the emissions and the conditions of already existing contamination of given regions. If new enterprises are constructed in built-up and already contaminated places, then naturally we must set

considerably more rigid standards for such enterprises than for a relatively pure region.

Our committee has also been ordered to inspect the observance of standards of allowable emissions.

[Question] We have received with great satisfaction the decree of the CPSU CC and the USSR Council of Ministers "On additional measures to intensify natural conservation and improve the use of natural resources." But couldn't you briefly comment on it and, in particular, cite examples of unfavorable situations in natural conservation in individual sectors of industry regarding which that extremely timely document speaks?

[Answer] It is very important to speak about the continuity of that decree, which is as it were a continuation of the 1972 decree of the CPSU CC and the USSR Council of Ministers entitled "On intensification of natural conservation and improvement of the use of natural resources." The continuity consists in the fact that in 6 years new information and new results of scientific research have been obtained which have permitted refining certain positions of the past document.

A very important section of the new decree is the section on the preservation of the atmospheric air. Now the officials of our committee are granted the right and charged with the duty of visiting and monitoring industrial enterprises. And also to impose corresponding sanctions. For example, in the decree it says that we have the right to forbid the operation of various facilities that exceed the set standards.

An important theme of the new decree is regulation of the condition of the air basin, including the question of planning the disposition of industrial enterprises with consideration of the quality of the natural environment and the interests of individual departments and ministries. Our state committee can now in practice influence these questions and conduct ecological expertise, and this will permit drawing a conclusion regarding the need for the work of a given enterprise in a given rayon and on a given technological level.

As for questions connected with contamination of the natural environment, I would like to distinguish three problems causing special concern.

Firstly, the problem of pure air in large cities, where the quantity of transport is constantly increasing. Our main highways are overloaded, especially in the peak hours, not only physically, so to speak, but also with harmful gas discharges. At crossings where traffic often idles, contamination increases, and increases considerably. This is a serious problem.

Secondly, the rivers. Raw sewage is being thrown into them more and more often, and toxic chemicals from agricultural fields run off into them.

And thirdly, the problem of the world ocean, which has no boundaries. Harmful substances coming from the territories of different states and from vessels can cause a stressed situation for the ocean as a whole and especially for inland seas.

[Question] But is it still possible to name specific examples?

[Answer] As for the most unfavorable effect on the environment, one should mention above all enterprises of the USSR Ministry of Ferrous Metallurgy, the Ministry of Chemical Industry and the Ministry of Petrochemical Industry, which still continue to contaminate the air of such industrial cities as Leninogorsk, Noril'sk, Monchegorsk, Yerevan, Kirovakan, Novokuybyshevsk, etc. A large "contribution"--about 60 percent--to the contamination of the air basin of the cities with sulfur dioxide is made by enterprises of the USSR Ministry of Power and Electrification.

Far from all questions have been solved by a number of those ministries also in the area of the purification of waste waters. Up to now, contamination by the wastes of enterprises of those ministries of rivers of Severnyy Donets, the Irtysh and individual sections of rivers of the Kola peninsula has been noted.

[Question] But what are the ways to completely eliminate such negative phenomena? What sanctions does the committee headed by you possess and how can the community contribute to this genuinely noble cause?

[Answer] We have already discussed with you questions of the control system. So that the first part of the question consists in the organization of a reliable system of observation and evaluation of the state of the environment. The second consists in the adoption of various decisions regarding regulation of the quality of the natural environment, that is, the wide application of ecological expertise, which has already been mentioned. Now our consent is necessary for the adoption of a plan. That mechanism is now being refined. We are preparing a system of control standards for the enterprises of each department. And when they have been signed by the ministry, its enterprises whose work involves contamination of the natural environment will bear responsibility for observance of the set standards, and in case of their violation will receive very rigid sanctions, up to the halting of production.

Now about help from the community and, I would say, more widely, help from our entire population, for the preservation of nature is a national cause. The role of society and public organizations is a great one, but the main thing is to have each person in production, from the worker to the director, especially those working at enterprises that affect the environment and contaminate it, have a suitable attitude toward this question and not think that it is his business only to produce the basic product. In our time all are obliged to protect the natural environment, which extends far beyond the limits of any enterprise. We want very much to emphasize this thought. Each

one, no matter what working place he stands at or position he occupies, must remember this and take an active part in the preservation of the natural environment.

[Question] LITERATURNAYA GAZETA has printed a great deal recently about the preservation of the environment in the city. We have talked about the struggle against noise, opened a discussion of "The Motor Vehicle and the Environment," and have discussed complex problems of the ecology of the city. In your opinion, what are the main tasks and the main difficulties here? What importance does your committee attribute to this subject?

[Answer] I would like to reply at once: the problem of protection of the environment in the city occupies and will occupy one of the main places in our work. It has many aspects, but the main one is contamination of the air.

In large cities this problem is especially acute and especially difficult to solve. For all the people to enjoy pure air, it is necessary to purify it completely within the city and the industrial region. This creates substantial difficulties.

We have constantly intensified monitoring of the state of atmospheric air and we monitor its contamination in 350 cities of the Soviet Union, and in Moscow, Leningrad and a number of other large cities we are organizing automated systems of observation and are now preparing a complex experiment to study in detail the quality of atmospheric air in the capital.

[Question] And when will that system of which LITERATURNAYA GAZETA has written go into operation?

[Answer] Its complexity consists not only in getting the system started. It is important to constantly increase the number of measured ingredients. And we are doing this. Therefore it will be difficult to determine the triumphant moment of its opening. It can be said that in Leningrad and Moscow we are approaching its testing. In the capital, on the basis of the results of a number of investigations they have been able to definitely determine which of the regions and parts of the city have been subjected to contamination and where it is necessary to apply the most serious measures. On the basis of the results of that investigation over 300 industrial enterprises were removed beyond the limits of Moscow.

Very serious measures are being carried out in the struggle against contamination from transport. The construction of underground crossings is not just a question of safety and of freer motion of motor-vehicle traffic. The crossings reduce the idling of machines, and this improves the purity of the air.

Unfortunately, fewer of us than I would like are still concerned about questions in the struggle against noise. True, a law on atmospheric air is now being prepared, in which the question of quiet ought to be included.

[Question] The city is the city, but city-dwellers have recently longed more and more for nature. Our readers complain about the slow creation of national parks in the USSR, but in the decree much space is allocated for reserves. What can you say about this matter?

[Answer] In the Soviet Union there are now more than 100 preserves that occupy a territory of about 10 million hectares, and they will be expanded and work on them will be improved, but the questions raised by you about national parks I consider to be a very serious one.

I think that that form of natural conservation and the acquaintance of a large number of people with its values is extremely important and promising. In a number of republics steps are now being taken to organize national parks, and that initiative must be supported in every possible way. For example, such work is being done in Lithuania.

[Question] But who among us ought to concern himself directly with that? Perhaps your committee will head the creation of national parks?

[Answer] I think it would be wrong to consider that the supervision and execution of all work in the area of the preservation of nature ought to be done by one certain department, even a special one. No, these are tasks, in my view, of the Ministry of Agriculture, the State Committee for Forestry and the USSR Academy of Sciences, and also a number of other departments.

As for us, we will do complex investigative work in biospheric preserves in order to obtain complete information about the background state of the environment in regions not exposed to anthropogenic effect. Such preserves are being created in Belorussia, in the Caucasus, in Central Asia, in the Far East and a number of other places. As a result of investigations conducted there we will be able to draw conclusions about how much the background is changing, that is, the basic state of the natural environment, since the contamination level at some "hot" points cannot characterize the general state of nature.

[Question] Yuriy Antoniyevich, as flows from the very title of the decree, it is directed not only toward the preservation of nature but also toward improvement of the use of natural resources. It seems to me that the most important of all problems of this area is the problem of reserves of energy resources. Everyone already knows now that the stocks of coal, oil and gas are not unlimited. There is a definite prejudice toward atomic energy. In the West concerns are expressed about its fatal influence on the environment. What do you think?

[Answer] Of course, it is necessary to have a careful attitude toward natural resources, especially energy resources, and from this point of view the question of the development of atomic power engineering requires intensified attention. In our country it is being developed very rapidly. And as a specialist in the area of natural preservation I can responsibly

say that the relative contamination in the case of the work of an atomic power plant is less than in that of a thermal power plant (per unit of power produced). That is, when a thermal power plant is in operation much more pure air is required to dilute the contaminations to completely safe concentrations than when an atomic power plant is in operation. It also is necessary to develop those directions of power engineering in which solar energy or wind energy is used.

[Question] But is there anything practical in that area?

[Answer] Yes, in Turkmeniya, for example, serious work has been started on the practical use of solar energy. In our country, and in other countries of the world, and in the World Meteorological Organization this question has been discussed and interesting recommendations have been made.

As for the rational use of natural resources, this problem is closely related to the problem of natural conservation. Very valuable products are often ejected into the air. During the combustion of ordinary fuel a large amount of valuable heavy metals is lost, metals which are simultaneously a dangerous component of contamination. Therefore the problem of protecting the air and water against contamination is closely connected with the problem of zealous of natural resources. Now included in wastes is a large quantity of valuable elements and materials which could successfully be used in the national economy.

[Question] Let's deal with some international problems now.

[Answer] Yes, in questions of preservation of the environment it is difficult to limit oneself to the national. For example, sulfur dioxide, distributed with air masses for great distances, including between different states, inflicts substantial damage on the environment. That problem has already become serious for Europe.

Bourgeois propagandists persistently stress the identical character of the discussed problem. They say, troubles in the socialist and capitalist worlds are one and the same, dust and filth are one and the same, and the ways to eliminate them are also identical. However, it appears, differences in the social systems permit looking at those problems differently. What do we have in common here, and what can we learn from one another? And what is the principal difference in the natural conservation policy of the world of socialism?

Dust and filth are really identical, but in the socialist and capitalist worlds there is an essential, principal difference in the approach to the preservation of the natural environment: with us there is an absence and in capitalist countries the presence of important contradictions between the interests of society and the interests of individual people. In the pursuit of profits private entrepreneurs neglect the interests of society. In the West there are frequent cases where individual companies do not

permit representatives of controlling bodies access to their territory to measure contamination of the environment, as that is disadvantageous to them--the struggle for purity can increase the cost of production. In a socialist society such contradictions do not exist, and with us and in the other countries of socialism efforts are directed toward satisfying the interests of all society.

However, the question is a correct one--can we learn anything from one another? Yes, we can, and therefore international collaboration is needed in order to unify efforts in preventing contamination of the environment, which has no boundaries, but also to solve purely scientific and engineering problems. Such collaboration is advantageous to both the Soviet Union and other countries.

We have wide and fruitful relations (multilateral and bilateral) with the socialist countries and there are bilateral contacts with the USA, England, France and some other capitalist countries.

We have a whole series of joint technical and engineering projects. For example, general investigations of the struggle against ejections into the atmosphere of sulfur dioxide and other harmful substances are being conducted. American specialists are studying with great interest the organization of the preservation of wild nature--flora and fauna and the organization of preserves in the Soviet Union. They have no such successes in that matter. On the other hand, the national parks about which you and I have spoken are very widely developed in the USA. Here we will learn from them. Joint basic scientific research will also be done. Thus, we are seriously collaborating with the USA in the area of study of the influence of man on the earth's climate, earthquake prediction and genetic consequences of contamination.

In my opinion, such collaboration must be developed.

[Question] And the last-mentioned. In which international organizations for environmental preservation is the Soviet Union participating and how is it fulfilling its international obligations?

[Answer] Besides those multilateral and bilateral forms of collaboration of which I spoke, it should be said that the Soviet Union participates in the work of a number of international organizations which directly or indirectly work in the area of preservation of the environment.

First of all it is necessary to name UNEP, the international program for preservation of the environment of the United Nations Organization. Within its framework interesting work is being done by our Soviet scientists, including in the area of the creation and development of a global system of observations of the state of the environment.

We would also like to note work being done by UNESCO. That organization now carries out the program "Man and the Biosphere." The Soviet Union, supporting its activity, has advanced and substantiated the project "Study of contamination of the environment and its influence on the biosphere."

In addition, we are participating actively in the World Mathematical Organization. Quite recently under its aegis history's first World Conference on Climate was held, at which 24 experts presented reports on the influence of human society on climate the the possible influence of climatic changes on human activity, agriculture and fishing. Reports were presented on problems of modeling climate and forecasting its possible changes and fluctuations. Four Soviet reports evoked great interest and the entire conference proceeded very successfully.

It adopted a declaration in which the importance of organizing a broad front of investigations of possible changes and fluctuations of climate (including as a result of anthropogenic effect) and the influence of such changes on the economic activity of man was stressed. In the declaration it was emphasized that the preservation of climate favorable for the vital activity of man is possible only under conditions of peace.

In conclusion I would like to remind the reader that the Soviet Union is an initiator in signing the Convention on Banning the Military or Any Other Harmful Use of Means of Effect on the Natural Environment. After the Moscow 1963 agreement on the banning of nuclear weapon tests in the atmosphere, space and under water the amount of radioactive precipitations decreased substantially all over the world.

The Communist Party and the Soviet state give constant attention to such a vitally important problem as preservation of the environment. A result of that policy was the proposal, advanced in 1973 by the general secretary of the CPSU CC, chairman of the Presidium of the USSR Supreme Soviet, comrade A. I. Brezhnev, on the conducting of a General European congress on questions of collaboration in the area of preservation of the environment.

Thank you for the interview.

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CSO: 3000

PRESERVATION OF ENVIRONMENT IN BELORUSSIA

Minsk SOVETSKAYA BELORUSSIYA in Russian 5 Jun 79 p 3

[Article by N. Dubovets, deputy chairman of the BeSSR State Committee for the Protection of Nature]

[Text] The attention of the government and the public has been attracted in our day to the problem of preservation of the living environment of man and the careful use of natural resources. These problems have grown over national boundaries, have become global and touch upon the interests of all peoples of the earth.

In 1972 at the Stockholm Conference of the United Nations Organization it was decided to declare 5 June to be the World Day of Preservation of the Environment. Since then that day has been observed each year in our country.

Our republic is an active participant in the UN program for the environment. This year it became a member of the council of managers of that program.

The importance of ecological problems in the world was emphasized by the 14th General Assembly of the International Union for the Protection of Nature and Natural Resources, held in Ashkhabad in September 1978. We had occasion to participate in it.

The assembly adopted a number of documents. One of the most important was the project, "World Strategy for the Protection of Nature." Its goal is to achieve as rapidly as possible and on a scientific basis preservation of existing natural resources on which the well-being of man will depend. In it the main requirements for the preservation of nature were formulated, recommendations were given on their fulfilment, and natural ecological systems of the planet were determined that experience under the influence of the economic activity of man such a heavy "load" that with respect to them timely measures must be undertaken.

More and more people on earth understand the need and timeliness of measures to preserve the resources of nature in all their variety and acknowledge the paramount importance of international collaboration to solve complex biological problems. After discussing the question, "World Strategy for the

Protection of Nature," the assembly adopted a "map of nature" that will be transmitted for discussion by all UN member-countries for the adoption of measures to preserve the purity of the environment.

The strategy of the Soviet society in the matter of the preservation of nature was very clearly formulated at the 25th CPSU Congress by the general secretary of the CPSU CC, Leonid Il'ich Brezhnev. He said: "Comrades, it is possible and necessary to improve nature, to help nature to more fully reveal its vital forces. There is a simple expression known to all, a "flourishing region." That's what they call lands where the knowledge, the experience of the people, their dedication and their love for nature really create miracles. That is our socialist path."

It was clearly shown to the participants in the international forum how the party policy on the preservation of nature and rational use of its resources is being implemented.

The Soviet Union has obtained enormous achievements in the area of the preservation of nature, of its animal and plant world, and the rational use of natural resources. This was bequeathed to us by the great Lenin. His signature stands on more than 100 documents on the preservation of nature, adopted in the first years of Soviet power. The Leninist course of the preservation of nature and rational use of natural resources received further development in the decisions of the 25th CPSU Congress and the new USSR Constitution. All this is inseparably connected with the activity of the party and government directed toward steady rise of the material and cultural living standard of the Soviet people and toward the good and happiness of future generations.

In our republic in recent years organizational, economic, scientific and educational work directed toward the rational use of natural resources and protection of the environment against contamination has also been considerably intensified. In a relatively short time the Belorussian people have achieved considerable successes in the transformation of nature.

In the republic 2.6 million hectares of swamps and marches have been drained. Great changes have occurred in Poles'ya. Cultivated landscapes have been created in the place of swamps. Over the entire republic the fertility of soils has been increased, as a result the gross production of agriculture is now 3.5 times the pre-revolutionary level.

To protect light soils against wind erosion, during the last 4 years in the republic forests have been sown on 40,000 hectares of sands not used in agriculture. On an area of about 2,500 hectares forest belts have been created that protect the fields. Many kolkhozes and sovkhoses are accomplishing various agrotechnical measures to protect the soil against water erosion.

As is known, forests occupy over a third of the territory of Belorussia. In recent years forest-restoration work has been done on an area larger than that of the fellings.

Green belts with a total area of over 800,000 hectares have been laid out around 108 cities and urban-type communities for rest of the population. With each year the areas of forest of the first group, having sanitary-protective and soil-protective importance, increase. Cities and villages of the republic are being provided with green belts in considerable volumes.

Much has also been done in the matter of protected areas. At the present time there are four preserves and preserve-hunting farms, six landscape, four hydrological, 12 medicinal and six hunting sanctuaries and 200 monuments of nature. Work is being done on the creation of the Naliborskoye preserve, a natural park and cranberry bogs, and expansion of the network of other hydrological preserves. The total prohibited territory amounts to over 800,000 hectares.

Definite successes have been achieved in the use and preservation of waters. In the last 3 years in the cities and at enterprises of Belorussia 176 purification installations have been constructed, with a total volume of capital investments of over 60 million rubles. Along with the construction and expansion of reservoir structures, measures are being accomplished to increase the effectiveness of their use.

The use and preservation of water resources has been noticeably improved. The volume of use of water in circulating systems of enterprises of the republic has reached 80 percent, while at the same time the requirements for fresh water in technological processes of an industrial enterprise have been reduced. The discharge of contaminated waste waters into rivers and lakes has been reduced by three-fifths. The water-supply and sewer systems of cities and industrial centers are becoming centralized, which makes it possible to rationally use and preserve water resources.

Much attention is being given to questions of protection of atmospheric air from contamination. Various dust collectors have been and are being constructed at enterprises of the republic. Many department boiler rooms, enterprises and houses are being transferred to centralized systems of heat and power supply, underground crossings on streets and circular highways around cities are being constructed and traffic is being limited when necessary.

Some work is also being done in the area of the preservation and reproduction of wild useful fauna.

In the current Five-Year Plan several tens of scientific institutions headed by the BeSSR Academy of Sciences are conducting investigations of many directions relating to the preservation of nature. It is very important that the main directions of political and scientific activity in the protection of nature since 1974 have consisted in annual plans of economic and social development. The basis of such planning is "Forecast of possible changes in the biosphere as a result of the development of sectors of the national economy to the year 2000," and also the prepared sector forecasts. A number

of comprehensive plans have already been compiled for the use and preservation of water and land resources by basins of the Zapadnaya Dvina, Sozh, Ulla and other rivers.

In recent years, as a result of investigations conducted in the region of the Soligorskiye potash mines by different scientific institutions, data have been obtained on the basis of which a number of measures to improve the natural situation in Soligorskiy Industrial Rayon have been developed and introduced.

In the republic work is being done on the study, generalization and distribution of leading experience, improvement of scientific and technological information services in the area of the preservation of the environment, and also on dissemination of these questions among the population. In the last 3 years about 200 republic, oblast and rayon conferences and seminars have been conducted, a demonstration of technical films has been organized and radio, television and the press have been widely used.

Issued regularly are the radio journal of the republic RODNAYA PRIRODA (Dear Nature), the TV journal PRIRODA I MY (We and Nature) and the popular-science journal RODNAYA PRIRODA. In 1977 the BeSSR Committee for the Protection of Nature jointly with the Belorussian Scientific Research Institute of Technical Information of the BeSSR State Planning Commission prepared an exhibit entitled "The preservation of nature in the BeSSR," which was demonstrated in our republic and in Bulgaria. Much work is done by our people's universities for the preservation of nature, which number 45 in the republic, and also by 49 workers' schools and 108 nature lovers' clubs.

For purposes of instilling feelings of a cautious attitude toward national resources and the adoption of habits of correct use of natural resources, the principles of the protection of nature are presented in the schools and higher and secondary specialized educational institutions.

Considerable work is done by the public. In the ranks of the Belorussian Society for the Protection of Nature are 3.1 million persons.

At the same time it should be noted that we still have a number of unsolved problems. The execution of designated plans and measures is not completely assured, the introduction of a number of purification and sewer structures into operation is delayed, the Law on the Preservation of Nature in the BeSSR is sometimes violated. The ministries and departments and local soviet organs of the republic sometimes undertake inadequate measures to increase the responsibility of managers of individual enterprises, organizations and institutions for observance of all the requirements of legislation and the decisions of the party and government in the area of the preservation of the environment and rational use of natural resources.

The party, soviet, planning, economic and trade-union organs and the managers of industrial enterprises, kolkhozes and sovkhoses, emphasized comrade P. M.

Masherov, candidate member of the Politburo of the CPSU CC and first secretary of the CP Belorussia, in his report at the 28th congress of the CP Belorussia, are called upon to constantly improve the practice of the use and reproduction of natural resources and consider a careful attitude toward them and questions of the preservation and improvement of the environment, not as a secondary matter but as a quite obligatory and organic part of their economic and social concerns.

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EFFECTS OF ATOMIC AND THERMAL ENERGY ON ENVIRONMENT

Minsk VESTSI AKADEMII NAVUK BSSR--SERIYA FIZIKA-ENERGETYCHNYKH NAVUK in Russian No 2, 1979 pp 50-57

[Article by A. F. Malenchenko: "Certain Aspects of the Effects of Atomic and Thermal Power on the Environment"]

[Text] The large and multibranch power industry which absorbs and processes an immense quantity of raw material pollutes the biosphere with industrial wastes and the interreaction with nature is complicated by the strengthening of a reverse reaction--the ecological load exerts a harmful influence on man. The changes in the direction of degradation of the environment are determined by thermodynamic limitations that are inherent in nature itself and depend on inefficient utilization of energy. In those cases where a large quantity of energy is produced inefficiently, and the efficiency of modern production from the point of view of the utilization of natural resources does not exceed 5-10 percent in the majority of cases, the degrading effects on the biosphere reach a considerable scale. Therefore, at the present time, in addition to such criteria as the physico-chemical description of energy resources, how economical they are and how accessible they are for utilization, new requirements related to the safety of their utilization for man's environment have been substantiated. It has become obvious that it is impossible not only to decide, but also to predict the prospects for the development of power engineering without an in-depth analysis of all factors. There can only be a systemic solution. The utilitarian-technogenic approach, with systemless expenditure of the earth's power resources, gives rise to numerous negative phenomena.

In the opinion of academician N. N. Semenov [Figure 1], all organic fuel will be extracted from the earth in 80-140 years, which leads to a number of serious consequences. One of them is the need to search for new sources of power supply. A realistic way of resolving this complex problem, which does not have convincing alternatives in the current stage, is to develop atomic energy. It is expected that by the year 2000 atomic electric power stations will produce about 50 percent of the overall quantity of electric power produced on earth. According to predictions, the installed capacity of the AES on earth will reach 300-350 gigawatts by 1985 [Figure 2]. As long as the number of AES's was not great, their effect on the biosphere was insignificant,

but with an increase in their number, their effects on natural ecosystems also increased. At the present time it is recognized that one of the most important problems in the development of atomic power engineering is the evaluation and prediction of radioecological consequences. The solutions to these problems are especially important for the densely populated European countries, taking into account the dispersion of AES's, enterprises for processing nuclear raw materials and manufacturing fuel elements, and plants for their processing as well as the need to ship highly active processed nuclear fuel. The complexity of the solution to the aforementioned problems can be traced especially clearly by comparing the predictions and the actual scale of the growth of AES's (Table 1). From 1970 through 1976 the capacities of AES's in the world increased 5-fold, but in 1973 they amounted to 60 percent of the planned increase and in 1975--about 66. In addition to technical-economic and political factors, this delay was brought about, to a certain degree, by the complexity of predicting the radioecological consequences of the creation of large nuclear power capacities, although when analyzing this problem, emotional and not scientifically substantiated arguments frequently predominate. The development of atomic power requires effective and reliable solutions to a large group of radioecological problems such as a qualitative and quantitative evaluation of the appearance of radionuclides in the biosphere, the determination of the patterns of their distribution and exchange in biological exchange chains, the effect of rays on the level of organisms, populations and communities, a study of the correlation between radioactive pollution of the environment and diseases in man, problems of combined influence, and so forth. On the plain of the implementation of these tasks, at the first All-Union Conference on Radioecology of Animals they considered the question of creating special research groups of a radioecological profile at the large AES's whose duty would be not only to resolve problems of providing for conflict-free interaction between AES's and the environment, but also to develop fundamental problems of ecology [Figure 4].

One of the negative factors in power engineering is the discharge of heat. It is impossible to completely prevent heat discharges since the efficiency factor of any machine is less than 100 percent. The efficiency factor of AES's is 30-32 percent, and TES's--35-40 percent. High-temperature reactors with an efficiency factor of 42-43 percent will make it possible to reduce heat discharges of AES's [Figures 5-7] (Table 2). The problem of heat discharges consists not only in their local effects on the biosphere, but they are also of a global nature. In our country alone, by the end of the century about 10 billion gigacalories of heat will have been discharged into the ponds, lakes and rivers. So far it has been more than difficult to evaluate the possible ecological consequences of this [Figure 8]. Up to the present time we have not developed substantiated hygienic and ecological normatives for heat pollution of bodies of water. On the sanitary-hygienic plain an increase in the temperature of water causes significant changes in the vital activity of organisms that populate it as a result of the oxygen content in the water, the increased solubility of many toxic substances and increased coefficients of accumulation of soluble toxic substances and radionuclides in the tissues of the fish. The degree of these changes is determined

by the amount of temperature changes. The thermal load of 5,000 kilocalories per square meter per day contributes to the intensification of processes of purification of bodies of water. With higher temperatures the sanitary condition of the bodies of water deteriorates as a result of a reduction in the processes of biochemical self-purification of the water. In warm water there is increased proliferation of disease-carrying organisms, fungi and algae. When studying the effects of thermal discharges at the Leningradskaya AES in the Gulf of Finland in a zone of reliable heating of the water (+ 1 degree) a change was noted in the makeup of the fish with an increase in the content of heat-loving species in the zone [Figures 5, 9, 10]. Still, one should not concentrate attention only on the negative aspects of thermal pollution of bodies of water. A moderate increase in the temperature of water in cool bodies of water can be used for intensive fish propagation. The population of these ponds with heat-loving herbivorous fish will make it possible not only to obtain high-quality food products, but also to protect the ponds from eutrofication. Additionally, the "excess" heat can be used for heating. The USSR has a considerable amount of experience in this. A heating installation provides heat for the industrial area and the residential buildings at the Beloyarskaya AES. The Bilibinskaya AES has become the first industrial atomic thermal electric station.

Table 1

Nuclear Power Programs of Several Capitalist Countries [3]

(6) Страна	(1) Ядерные мощности (нетто), ГВ (мл.)			
	(2) действующие	(3) строящиеся	(4) ранее планируемые на 1985 г.	(5) прогнозы на 1985 г. в настоящее время
(7) Франция	3	23	45	30
(8) ФРГ	6	14	45-50	30
(9) Япония	7	10	60-49	25
(10) Испания	4	7	—	14
(11) Швеция	4	7	—	11
(12) США	46	75	230-275	120

Key:

- | | |
|--|-------------------|
| 1. Nuclear capacities (net), gigawatts (electricity) | 7. France |
| 2. Operating | 8. FRG |
| 3. Under construction | 9. Japan |
| 4. Previously planned for 1985 | 10. Spain |
| 5. Present predictions for 1985 | 11. Sweden |
| 6. Country | 12. United States |

Table 2

Proportional Expenditure of Cooled Water, liter/kilowatt/hour [6]

(1) Year	(2) AES	(3) TES	(4) TETs
1970	220	132	113
1975	200	127	101
1980	160	120	80
1985	150	118	67
1990	138	110	56
2000	125	104	50

Key:

1. Year
2. AES
3. TES
4. TETs

An important task for the protection of cool bodies of water is to protect them from radioactive pollution. Discharges of radionuclides with used waters should not exceed the concentration of these isotopes in drinking water. Lake Imandra and the Kol'skaya AES can serve as an example in high efficiency in the protection of natural bodies of water from radionuclides. Throughout the course of the year less than one Ki of splintered and induced radionuclides enter the lake along with wastewaters and, for comparison, as a result of global discharges and discharges with river waters flowing to the lake up to 100 Ki ^{90}Sr and ^{137}Cs enter the lake [5, 10]. The entry of artificial radioisotopes into the environment introduces a qualitatively new factor which can disturb the adaptation mechanism that was developed by evolution and caused the appearance of a broad spectrum of changes in living organisms. Atomic energy makes an insignificant contribution to the process of change in the radioactivity of the biosphere, which depends mainly on radioactive fallout after nuclear test explosions and the increasing scope of the utilization of nuclear installations and isotopes in science and technology. The northern hemisphere has received an additional dose of 1 to 10 percent of the natural radiation and the dose absorbed by the marrow and the soft tissues of the bones during 1953-1973 have amounted to 0.9-1.0 millirads per year. The dose of background radiation received by man's critical organs depends on the conditions and the geographical location where he lives, amounting to an average of 100-150 millirads and reaching 8,000-12,000 millirads a year in individual regions. According to data of the U.S. National Environmental Protection Agency, the effects of radiation on man from all sources of radiation take form from the following factors: natural background--100-150 millirems per year; medical procedures--100; radioactive fallout not related to AES's--5 and that related to AES's--0.01 millirems a year [Figure 12].

Radioactive wastes are formed in all stages of the nuclear power cycle: the extraction and processing of ore with the production of fuel elements, the operation of the AES, the processing and burying of wastes. In the first stages, the isotopes ^{224}U , ^{235}U , ^{238}U , ^{226}Ra , ^{230}Th , ^{210}Pb and ^{210}Po represent the main danger. A power reactor with the capacity of 1,000 megawatts forms up to $1.2 \cdot 10^{10}$ Ki of radioactive wastes [Figure 13]. In terms of radiobiology the most significant isotopes are of strontium, cesium, iodine, yttrium,

zirconium, niobium, ruthenium, rhodium, berium, lanthanum, cerium and promethium. The mixture of the products of activation consist of isotopes of carbon, fluorine, chromium, iron, cobalt, manganese, zinc, copper and others. According to rough figures, the total quantity of products of fission will reach $0.4-2 \cdot 10^{12}$ Ki by the year 2000 (Table 3).

Table 3

Calculation of Need for Power in Future
and Quantity of Wastes [14]

(1) Показатель	1963 г.	1980 г.	2000 г.
(2) Тепловая мощность ядерных установок, МВт	$2 \cdot 10^4$	$(0.8-3) \cdot 10^5$	$(0.5-3) \cdot 10^6$
(3) Общая активность продуктов деления, Ки	$(1-2) \cdot 10^{10}$	$(0.6-2) \cdot 10^{11}$	$(0.4-2) \cdot 10^{12}$
(4) Количество отходов, т/день	5	25-80	125-800
(5) Накопленный объем отходов, л	$19 \cdot 10^6$	$(4-11) \cdot 10^8$	$(2-11) \cdot 10^9$

Key:

- | | |
|---|--|
| 1. Indicator | 3. Overall activity of products of fission, Ki |
| 2. Thermal capacity of nuclear installations, Megawatts | 4. Quantity of wastes, tons per day |
| | 5. Accumulated volume of wates, liters |

This is a significant amount if one takes into account the fact that the content of natural radioisotopes in the earth's crust is estimated in the amount of about 10^{11} Ki [Figure 15]. The entry of even part of this activity into the environment can cause more serious consequences than several natural disasters could cause [Figure 16].

According to estimated figures, the expected entry of radioactive wastes into the environment by the year 2000 will amount to (Ki): $^{85}\text{Kr} - 7 \cdot 10^8$, $^3\text{H} - 5 \cdot 10^7$, $^{14}\text{C} - 2.5 \cdot 10^4$ and $^{129}\text{I} - 1.2 \cdot 10^3$. From these isotopes the load of dosage on the sexual glands will amount 0.1 millirems per year with a natural background of 100-150 millirems per year [Figure 17]. High-speed reactors contribute additionally to radiation. With the 2,200 breeders with 1,000 megawatts (electric) each which are expected by the year 2025, the total discharge of ^{238}Pu , ^{239}Pu , ^{249}Pu , ^{241}Am , ^{242}Cm and ^{244}Cm into the atmosphere will amount to 0.36 mKi of alpha-activity per 1,000 megawatts (electric) per year [Figure 18].

In recent years attention has been devoted to the long-lived isotopes of tritium and carbons. Before the beginning of thermonuclear testing on earth there were about $9 \cdot 10^6$ Ki of tritium [Figure 19]. An additional discharge into the atmosphere of 10^8 Ki of tritium will cause a dose of radiation to the population of 10^{-6} rems a year [Figure 20]. According to the figures [Figure 21], during a year of operation of an FWR reactor with the capacity of 3,600 megawatts (heat) approximately $1.1 \cdot 10^4$ Ki are

formed as a result of fission and $1.38 \cdot 10^3$ Ki of ^3H are formed as a result of reaction with boron. Radiocarbon which has appeared in addition to that found in the environment, in the opinion of L. Pauling, represents the same danger as other radionuclides. The discharge of ^{14}C into the earth's atmosphere with the operation of an AES is estimated at 0.1-0.7 mKi·day per megawatt (heat). According to predictions, with a total capacity of AES's of $2.5 \cdot 10^6$ megawatts, the discharges of radiocarbon into the atmosphere will reach $1.9 \cdot 10^7$ Ki, which exceeds the natural level by 200 percent [Figure 22].

A comparison of the effects on the environment of AES's and TES's reveals both the similarities and differences in their influences on nature. One of the differences is the fact that the AES does not need oxygen for fuel combustion. This eliminates the discharge of carbon dioxide into the atmosphere. Even now, certain territories of the earth are expending considerably more oxygen than is formed in the process of photosynthesis on them. It is expected that by the year 2000 about 95 percent of the annual volume of oxygen formed through photosynthesis by plants on earth will be used for industrial needs. With a 5-percent annual increase in the quantity of combustible fuel, even in 150-180 years the oxygen content in the atmosphere can decrease to a critical level [Figure 23]. Moreover, an immense quantity of pollutants enter the atmosphere. In 1970 throughout the world along with products of combustion of all kinds of organic fuel, the atmosphere was polluted by up to 100 million tons of solid substances, about 150 million tons of sulphur oxides, about 300 million tons of carbon oxides, more than 50 million tons of nitrogen oxides, and so forth. According to data of Soviet writers cited at the 4th Geneva Conference, with the utilization of petroleum and gas alone for the development of power engineering, by the year 2000 there will be a 10-fold increase over the maximum permissible concentrations of sulphur dioxide and light ash in the air. Here one should take into account the fact that discharges from TES's are more dangerous in terms of their biological effect than the discharges from AES's (Table 4).

Table 4

Relative Danger of Gas-Forming Wastes of TES's and AES's
for the Human Organism in Number of PIN (6)

(1) Тип станции	(2) Основные загрязнители	(3) Максимальные
(4) ТЭС на угле	2.01	2.73
(5) ТЭС на нефти	1.69	0.64
(6) АЭС с ПWR	0.002	0.001

Key:

- | | |
|--------------------|------------------------|
| 1. Type of station | 4. TES using coal |
| 2. Main pollutants | 5. TES using petroleum |
| 3. Trace elements | 6. AES using PWR |

Moreover, a solution to the energy problem through atomic energy alone, in turn, gives rise to complex phenomena on the economic-ecological plan. (Table 5).

Table 5

Necessary Number of Reactors
for Power Supply for Mankind [24]

(1) Показатель	(2) Минимальный прогноз потребностей в энергии 5 млрд. кВт (1.5 кВт на душу населения)	(3) Максимальный прогноз потребностей в энергии 300 млрд. кВт (20 кВт на душу населения)
(4) Число реакторов	400	2400
(5) Количество плутония в реакторах, т	2500	150000
(6) Количество плутония, производимого ежегодно, т	250	15000
(7) Количество транспортировок ядерного топлива в год	35000	2100000
(8) Количество строящихся ежегодно реакторов	8	480
(9) Соотношение между ядерной и солнечной энергией, поглощаемой землей	1:24000	1:400

Key:

- | | |
|--|---|
| 1. Indicator | 6. Quantity of plutonium produced annually, tons |
| 2. Minimum prediction of need for 5 billion kilowatts of power (1.5 kilowatts per capita) | 7. Number of shipments of nuclear fuel per year |
| 3. Maximum prediction of need for 300 billion kilowatts of power (20 kilowatts per capita) | 8. Number of reactors constructed annually |
| 4. Number of reactors | 9. Ratio between nuclear and solar energy absorbed by the earth |
| 5. Quantity of plutonium in reactors, tons | |

In connection with the radiation effects of AES's on the environment, research was conducted to determine the radioisotopes in the discharges from TES's. It turned out that discharges from TES's, in addition to various toxic substances and compounds, contain a considerable quantity of natural radioactive isotopes (Table 6). The dose of radiation in the skeleton from ^{226}Ra discharged with products of combustion of organic fuel by a TES amounts to 0.11 millirems/year per megawatt (electricity) as compared to the dose of 10^{-7} millirems/year per megawatt (electricity) on the thyroid gland or $2 \cdot 10^{-4}$ on the entire body received with the operation of an AES [26]. According to calculated data, the average individual doses of radiation among the population as a result of radioactive discharges of TES's are higher than from AES's (Table 7). The AES's do not make the radiation situation worse in the zones where they are located. On the territory around the Beloyarskaya AES the average dosage of radiation in 1970 was 123 ± 5 millirems per year and in 1972-1973-- 120 ± 5 millirems per year and around the Novovorozhenskaya AES

in 1972 it was 95 ± 4 millirems per year with the dosage in the control regions being 115 ± 2 millirems per year [Figure 27]. One should note, however, that there are individual publications in literature that show the negative effects of AES's on the health of people who live around them [Figure 28].

Table 6

Wastes from Electric Power Station
With Capacity of 1,000 Megawatts (electricity) [25]

(1) Отходы	(2) Вид топлива			
	(3) уголь	(4) нефть	(5) газ	каждый горючий (6)
(7) Годовой расход топлива	$2.3 \cdot 10^6 \text{ т}$	$73.5 \cdot 10^6 \text{ м}^3$	$190 \cdot 10^6 \text{ м}^3$	1.13 т
(8) Годовое выделение загрязняющих веществ, тыс. т				
(9) Окислы серы	139	52.5	0.0136	0
(10) Окислы азота	20.8	21.8	12.2	0
(11) Окислы углерода	0.52	0.009	—	0
(12) Углеводороды	0.208	0.665	—	0
(13) Альдегиды	0.0545	0.117	0.317	0
(14) Летучая зола	4.48	0.725	0.454	0
(15) Годовое выделение радиоизотопов, Ки				
$R_{\text{a}}^{\text{тн}} (T_{1/2} = 1620 \text{ лет})$ (16)	0.0172	0.00015		0
$R_{\text{a}}^{\text{тн}} (T_{1/2} = 5.7 \text{ лет})$	0.0108	0.00035		0
(17) Радиоактивные благородные газы	0	0	0	0
PWR				600
BWR				$1.11 \cdot 10^6$
gas	0	0	0	0
PWR				0
BWR				0.65

Key:

- | | |
|--|---|
| 1. Wastes | 9. Sulphur oxides |
| 2. Type of fuel | 10. Nitrogen oxides |
| 3. Coal | 11. Carbon oxides |
| 4. Petroleum | 12. Hydrocarbons |
| 5. Gas | 13. Aldehydes |
| 6. Nuclear fuel | 14. Light ash |
| 7. Annual expenditure of fuel | 15. Annual formation of radioisotopes, Ki |
| 8. Annual formation of pollutants, thousands of tons | 16. Years |
| | 17. Radioactive inert gases |

The scientific concept of radiation security is based on a recognition of the lack of a threshold for the action of radiation and the linear dependency between dose and effect. It is now more acceptable and substantiated with norms for radiation effects both for occupational workers and for the entire population, although it does give rise to the problem of the relationship between risk and socioeconomic advantage. It is thought that the socially acceptable occupational risk irrespective of benefit or advantage determined by the nature of the work is the level of $5 \cdot 10^{-4}$ per person per year [Figure 29]. According to calculations, the overall risk of death from

radiation effects of an AES with the criterion for safety being 5 millirems per year is estimated at $3 \cdot 10^{-7}$ per person per year. A comparison of this amount with the risk of death from other causes shows that atomic energy is among the least harmful industries (Table 8). This same pattern is also revealed upon analysis of remote effects (the development of tumors, reduced lifespan) which do not manifest themselves for many years (Table 9).

Table 7

Average Individual Doses of Radiation Among the Population
From Radioactive Discharges from AES's and TES's,
millirems per year/ 10^3 megawatts (electricity) [12]

(1) Объект	(2) Вблизи станции		(3) Вдоль магистралей	
	(4) АЭС	(5) ТЭС	(4) АЭС	(5) ТЭС
(6) Все тело	0.73	0.53	$3.5 \cdot 10^{-4}$	$3.2 \cdot 10^{-4}$
(7) Костная ткань	1.0	114	$4.2 \cdot 10^{-4}$	$2.0 \cdot 10^{-3}$
(8) Легкие	$7.3 \cdot 10^{-4}$	41	$6.5 \cdot 10^{-4}$	$7.5 \cdot 10^{-3}$
(9) Костный мозг	0.32	14.5	$1.5 \cdot 10^{-4}$	$2.6 \cdot 10^{-4}$

Key:

- | | |
|----------------------|----------------|
| 1. Radiation | 6. Entire body |
| 2. Near a station | 7. Bony tissue |
| 3. Entire population | 8. Lungs |
| 4. AES | 9. Marrow |
| 5. TES | |

Thus, analysis and experience that has been accumulated up to the present time in the operation of more than 1,000 reactor-year without accidents or harm to the population shows that with respect to the effects on nature and man, atomic energy is many times "cleaner," more reliable and safer than power sources which use the traditional organic kinds of fuel. The reliability of the operation of atomic power installations at the present time has reached such a degree that the probability of accidents at them is very low and comparable only with the fall of a large meteorite.

Still, the prospects and scale of development of atomic power determine the need for solving a number of complex long-term radiobiological problems. They include the problem of the biological role of natural radioactivity, the effects of small doses of radiation, the patterns of migration of radionuclides in the biosphere and biological exchange chains, and the heterogeneity of subcellular distribution of doses from incorporated radionuclides. Special attention should be devoted to the combined effects of radioactive, chemical and thermal discharges. The question of possible increased effects of radionuclides under the influence of chemical substances in the processes of mutagenesis and carcinogenesis requires special consideration. So far we have not finally solved the problem of burying radioactive wastes from AES's and have not created a global model for the distribution of radioactive wastes from the nuclear power cycle in the biosphere. These problems are

being intensively developed and successfully resolved. Measures taken in the USSR for protection of the air basin, bodies of water and the soil have been reinforced in Article 18 of the USSR Constitution: "In the interests of present and future generations, the USSR is taking the necessary measures for the protection and scientifically substantiated, efficient utilization of the earth and its crust, water resources and the vegetable and plant world as well as for maintaining the purity of the air and water, providing for the reproduction of natural riches and improving man's environment" and it guarantees a successful solution to the problem of developing atomic energy and preserving the purity of the environment.

Table 8

Risk of Death Resulting from the Living Environment
(per person per year) [29]

(1) Вид воздействия	(2) Риск смерти	(3) Примечание
(4) Катастрофы в искусственной среде обитания	10^{-6} — 10^{-8}	смог, аварийное загрязнение внешней среды и др. (12)
(5) Выбросы электростанций	$4 \cdot 10^{-6}$ — $2 \cdot 10^{-8}$	загрязнение атмосферы (13)
(6) Выхлопные газы автомобилей	$(1-5) \cdot 10^{-6}$	в промышленно развитых странах (14)
(7) Выбросы и отходы АЭС	$5 \cdot 10^{-6}$ — $3 \cdot 10^{-7}$	при дозе 1—5 мбэр в год на границе зон АЭС
(8) Глобальные выпадения радиоактивных веществ	$(2-5) \cdot 10^{-7}$	при годовой популяционной дозе $(1-2) \cdot 10^{-6}$ человека/бэр (15)
(9) Медицинские процедуры с применением излучений	$5 \cdot 10^{-6}$	при годовой популяционной дозе $1.5 \cdot 10^{-7}$ человека/бэр (16)
(10) Прочие воздействия радиации	$(1-2) \cdot 10^{-7}$	радиоактивные вещества в товарах широкого потребления, излучение телевизоров (17)
(11) Все виды воздействия искусственных источников радиации	$(3-6) \cdot 10^{-6}$	исключая профессиональное облучение (18)

Key:

- | | |
|---|--|
| 1. Kind of effect | 12. Smog, accidental pollution of the external environment and so forth |
| 2. Risk of death | 13. Pollution of the atmosphere |
| 3. Remark | 14. In industrially developed countries |
| 4. Accidents in an artificial living environment | 15. With annual population dose of $(1-2) \cdot 10^{-6}$ men/rem |
| 5. Discharges from electric power stations | 16. With annual population dose of $1.5 \cdot 10^{-7}$ men/rem |
| 6. Exhaust fumes from motor vehicles | 17. Radioactive substances in consumer goods, radiation from television sets |
| 7. Discharges and wastes from AES's | 18. Excluding occupational radiation |
| 8. Global fallout of radioactive substances | |
| 9. Medical procedures using radiation | |
| 10. Other effects of radiation | |
| 11. All kinds of effects of artificial sources of radiation | |

Table 9

Additional Number of Deaths from Malignant Growths,
incidents per year per 1,000 megawatts (electricity) [30]

(1) Причина смерти	(2) ТЭС		(3) АЭС	
	вблизи стан- ции на 10 ⁶ (4) человек	всё население (5)	вблизи стан- ции на 10 ⁶ (4) человек	всё население (5)
(6) Лейкозы	0,5	$2,1 \cdot 10^{-3}$	$2,9 \cdot 10^{-3}$	$3,5 \cdot 10^{-4}$
(7) Опухоли костей	0,1	$5,2 \cdot 10^{-3}$	$4,8 \cdot 10^{-4}$	$2,9 \cdot 10^{-3}$
(8) Опухоли щитовидной железы	—	—	$4,0 \cdot 10^{-4}$	$1,0 \cdot 10^{-4}$
(9) Опухоли легких	1,7	$7,8 \cdot 10^{-3}$	$3,0 \cdot 10^{-3}$	$4,2 \cdot 10^{-4}$
(10) Различные опухоли при облучении всего тела	0,1	$4,9 \cdot 10^{-3}$	$2,7 \cdot 10^{-3}$	$3,0 \cdot 10^{-3}$
(11) Все причины	2,4	$10,0 \cdot 10^{-3}$	$3,4 \cdot 10^{-3}$	$3,0 \cdot 10^{-3}$

Key:

- | | |
|---|---|
| 1. Cause of death | 7. Bone tumors |
| 2. TES | 8. Thyroid tumors |
| 3. AES | 9. Lung tumors |
| 4. Near station, per 10 ⁶ people | 10. Various tumors with radiation
of the entire body |
| 5. Entire population | 11. All causes |
| 6. Leucosis | |

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11772

CSO: 5000

PROTECTING SUMGAI'S CLEAN AIR

Baku VYSHKA in Russian 30 Jun 79 p 2

[Article by G. Bochanov]

[Text] The young modern city of Sumgait is always growing, its multisector industry is developing and the technique and technology of production are being complicated. In such a case it is important to foresee negative side effects of scientific and technological progress and prevent them by natural conservation measures, striving not to allow loss to the ecological well-being of the city. But it is a far from easy matter to improve our living environment. To elevate the culture of life and working conditions, to be concerned about the purity of the air basin of the environment means to display concern about the health of man.

On the eve of a session that examined these questions we met with the chairman of the ispolkom of the municipal soviet, Zul'fa Salekhovich Gadzhiyev. He noted that it is precisely from such positions that the gorsoviet also examines this question. The requirements have been made more rigid for the managers of enterprises. This has given its results in any stage.

In October 1975 the third session of the gorsoviet examined the question of intensifying the preservation of the environment and approved measures from 45 points. Specific tasks were set for enterprises of the chemical and petrochemical industries, ferrous and nonferrous metallurgy and also other sectors. The dates of completion of the designated work were determined.

Three and a half years passed. Again a session is held and the deputies discuss the same question of the status of environmental preservation and measures for its further improvement. Had much been done, and what changes had occurred during that time? The ispolkom chairman, Z. Gadzhiyev, reported that the decision of the third session had been repeatedly verified, with discussion at the ispolkom session.

In the "Organicheskiy sintez" Production Association obsolete structures have been replaced and some technological units and processes have been improved. Some of the designated work was done at the synthetic rubber plant, in the "Khimprom" Association, at the Aztrubzavod and at other

enterprises. As a result the quality of the waste waters was improved somewhat and the quantity of gas emissions into the atmosphere was reduced. Laboratory investigations conducted by workers of the municipal sanitary and epidemiological station testify to this.

While listening to the reporter and the speakers I examine the decision of the third session. I check the reports of the speakers with individual points in that decision. The comment arises: hasn't too little been done? But words of confirmation are already coming from the rostrum: out of 45 organizational and technical measures designated three and a half years ago, a total of 18 has been carried out.

At the same superphosphate plant the reconstruction of the absorption section has been delayed, and in the sulfuric acid shop they continue to work without local purifying equipment. In the "Orgsintez" Production Association, at the synthetic rubber plant, as before, night and day gas flares pour smoke into the sky. They have no time to change those flares to smokeless combustion. Reddish residues of fluorine compounds and other harmful substances stretch out. At the aluminum plant they have not undertaken measures to accelerate reconstruction of the gas purification system. Gases are being ejected into the atmosphere from shops of chlorine and sulfanol production at the "Khimprom" Association.

Why have the set periods of work on those sections been disrupted, and who is guilty? The participants in the session, of course, hoped to hear precise answers to those questions. But some of the speakers spoke more about what has already been done and were silent about the reasons that the work was not done. The directors told much that was interesting: N. Babayev of the "Orgsintez" Association and N. Agayev of the superphosphate plant. True, much had been done there. But the managers of those large enterprises said nothing about why at the "Orgsintez" there were 44 sources of atmospheric contamination and at the superphosphate plant 36 that were not yet equipped with gas and dust collectors. They went further at the "Khimprom." Still more sources of environmental contamination there do not have purification devices.

What is the true reason for such an extremely unsatisfactory situation? The chairman of the permanent deputies' commission for natural conservation, chief of the municipal sanitation and epidemiological station, T. Shamilov, said that the commission and the station make decisions and adopt preventive measures. And what happens? It turns out that such measures have little effect. The managers of a number of enterprises have monetary penalties imposed on them. But they pay them, not out of their own, but out of the government's pocket!

The managers of enterprises often consult with one another, and we do not always succeed in making it clear who is right and who is guilty.

It is not just a matter of inefficient work of existing gas purification equipment. Quite often the technological processes are seriously disrupted.

The specialists have determined that such disruptions are the cause of over half of all ejections of harmful gases into air zones and low-quality runoffs into the sea.

The session clearly showed that the managers of a number of enterprises have not displayed due responsibility and the ispolkom has inadequately monitored the performance of measures designated earlier. The gorsoviet session strictly required from all management, chief engineers and shop chiefs that they bring the purification equipment into order in a short time and adopt effective measures to reinforce labor and technological discipline, and warned them of personal responsibility for the purity of the air in the environment.

The session of the Sumgait gorsoviet adopted a good decision and approved specific measures to reinforce natural conservation. One thing remains: to take on the practical work in a businesslike manner.

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PURIFICATION OF INDUSTRIAL WASTES DISCUSSED

Baku VYSHKA in Russian 16 Jun 79 p 3

[Article by A. Zhdanov, chief of laboratory for purification of waste water of the Gipromorneftegaz scientific research and planning institute, candidate of technical sciences; and I. Guseynov, group leader: "In Order to Protect Nature"]

[Text] We know what a large amount of attention our country devotes to protecting the environment. The Soviet State spares no money to protect nature and multiply her riches. New purification installations are being constructed at enterprises and existing ones are being improved. They make it possible to prevent pollution of the soil and water with harmful substances.

Additionally, it is very important to create small, compact installations for enterprises and production facilities for the volume of industrial waste is small.

The collective of the laboratory for the purification of waste waters of the Gipromorneftegaz scientific research and planning institute has been given the task of creating precisely these installations. They are especially needed by numerous ships that traverse the expanses of the Caspian Sea as well as floating and stationary drilling platforms. It was decided to construct installations from the basis of the application of the electrocoagulation method, that is, the removal of petroleum products in the water through a constant electrical current. Our co-workers have visited machine building shops in Minsk and Gor'kiy where such installations are being used and they studied their operation.

But what we saw there was not altogether suitable for the conditions of the Caspian. The laboratory's collective had to do a good deal of work to present a design for the new installation. Its principle of operation is not especially complicated and consists in the following. The petroleum products contained in industrial wastes are subjected to preliminary purification by passing through a layer of polystyrene and then they go into a container where, under the effects of the current, they are more thoroughly purified of organic compounds.

A number of practical problems were solved during the course of the work. They include, primarily, the calculation of the optimal speed of the flow of liquid through the system, the necessary density of the flow, the optimal sizes of the plates or electrodes with a given productivity of the installation and its dimensions.

It was also necessary to select the best materials for manufacturing working parts. Thus, numerous experiments showed that the most effective materials for the plates and electrodes are aluminum alloys and the best insulator is ebonite. Laboratory workers were very active in this work. The main designer was K. Voroshilov and the group leader was S. Samedov.

The results that were received were extremely reassuring. Suffice it to say that the fish, crayfish and other inhabitants of the water environment felt wonderful in the water that was purified by the electrocoagulation method. The content of organic substances in it decreased to 1-100th of a milligram per liter which is a quite acceptable indicator and the toxicity decreased 1,500-fold and reached practically zero.

Workers of the Shipyard imeni XXI s"yezda KPSS took on the responsibility of manufacturing an experimental industrial batch of the new installations. They had to overcome many difficulties in doing this. Many troubles were caused by the manufacture of electrodes from aluminum alloy which are welded and cut in a gas medium. Ship repair workers of the plants imeni Vano Sturua and imeni Parizhkaya Kommuna helped to perform this operation successfully.

The readers will obviously be interested in knowing the cost of the set of new purification equipment which includes blocks with a polystyrene load, an electrocoagulator, a sedimentation container and an electroblock which has registering instruments and certain other devices. A calculation showed that the cost of installation does not greatly exceed 4,000 rubles, which is quite affordable for small businesses.

The new purification installation was first tried out at the Zykhszkaya technical supply base of Kaspneftegazflot. The workers of the enterprise did everything possible to carry out the installation and startup in the shortest possible periods of time and on a high technical level. I should like to take special note of the efforts of the patron mechanic, V. Vereninov, the base chief, S. Akperov and the master, A. Asadov.

The industrial tests confirmed the installation's great effectiveness: after water with a large content of salts and petroleum products was treated by the electrocoagulation method, it became practically distilled. This was also confirmed by an inspection conducted by representatives of the republic Kaspvovnadzor administration.

It should also be noted that during the course of the testing suggestions were made for further improvement of the installation. For example, a suggestion was made to introduce special automatic devices into the

technological cycle which would regulate the force of the current, depending on the quantity of water that is being purified and would provide for changing the poles of the electrodes. This will make it possible to reduce the expenditure of electric power by a fairly large amount.

In the near future we shall begin to operate another installation--on a bunker ship which, while supplying the petroleum fleet with fuel and lubricants, will take in water containing petroleum products that have entered it during the time of operation of the engines.

The application of the electrocoagulation method for purifying waste waters has been included in the plans for the introduction of new technical equipment at enterprises of Glavmorneftegaz of the USSR Ministry of the Gas Industry.

But we think that the installations created by the institute can be widely used in other branches of the national economy as well. In particular, the implementation of the large tasks earmarked in the decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures for Further Specialization of Agricultural Production and the Development of Viniculture and Winemaking in the Azerbaijan SSR" requires the participation of a considerable quantity of agricultural equipment and the creation of service and repair bases. Of course, a fairly large amount of water will be expended with the operation of these facilities. The utilization of these compact and inexpensive installations for purifying industrial waste waters will undoubtedly produce no small economic effect and protect the environment from pollution.

When implementing the party decisions concerning the protection of nature, scientists and planners will wage a persistent search for efficient new means of purifying industrial wastes.

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DYKHNO DISCUSSES USE OF SECONDARY ENERGY RESOURCES

Baku VYSHKA in Russian 15 Jun 79 p 3

[Interview with A. Yu. Dykhno, deputy director for science of the All-Union Scientific Research and Planning Institute of the Energy Industry, candidate of technical sciences, by A. Podpalyy: "Utilizing Secondary Resources"]

[Text] The decree of the CPSU Central Committee and the USSR Council of Ministers "On Providing the National Economy and the Population With Fuel and Electric and Thermal Power in the Autumn and Winter Period of 1979/80" emphasizes the need to develop and implement measures for economizing on fuel and electric and thermal power and also to organize the strictest control over their efficient utilization.

One of the ways of efficiently utilizing electric and thermal power is to find reserves for secondary utilization of thermal resources. Thus at enterprises in Sumgait alone there is an additional reserve for saving more than 50,000 tons of conventional fuel by utilizing secondary thermal power resources, which include various combustible mixtures which are formed in industry, gases that are discharged into the atmosphere and steam from secondary boiling.

Until recently, only two-thirds of the secondary fuel resources were utilized here and even less of the secondary thermal resources--30.6 percent. These figures became known because of comprehensive research that was conducted for the first time in the country at the Sumgait industrial center by specialists of the All-Union Scientific Research and Planning Institute of the Power Industry and its Baku Branch.

A VYSHKA correspondent asked the deputy director for science of the All-Union Scientific Research and Planning

Institute of the Power Industry, a candidate of technical sciences, A. Yu. Dykhno, to discuss how this large amount of complicated work was done and what still has to be done for Sumgait industrial enterprises to strengthen the system of economy.

[Question] Al'bert Yul'yevich, it is noted in the "Main Directions for the Development of the USSR National Economy in 1976-1980" particularly that important aspects for increasing production efficiency are to improve the structure of the fuel and power balance, to combine various kinds of fuel efficiently, to improve their utilization and to use secondary power resources more fully for this. Why is it that the attention of our institute's specialists was concentrated on the latter?

[Answer] I shall begin with an example. Let us take an enterprise where excess heat is produced during the course of production. What should one do with it? One can utilize it for one's own needs. Or give it to a neighbor. It seems simple. In fact, it is necessary to solve a number of complex problems which one plant is sometimes not capable of doing. Therefore, the heat is discharged into the atmosphere. Scientists have seen that such losses are increasing each year. They are great.

Therefore, it was necessary to take up this problem in earnest. It required a comprehensive, interbranch approach to investigating the entire industrial center, in this case--Sumgait. And we did not select Sumgait at random. About 20 large enterprises of various branches of industry are concentrated here, such as ferrous and nonferrous metallurgy, petrochemistry and so forth. Finally, Sumgait is a formed industrial center where it is relatively easy to determine the secondary power resources and find the most efficient use for them.

[Question] What problems were raised during the course of the investigation?

[Answer] First of all there was the problem of analyzing the power and heat consumption of each enterprise. On the basis of this, it was necessary to improve the scheme for the utilization of fuel and power resources. Finally, it was necessary to determine the kinds and volumes of secondary thermal energy that could be used both within and outside the enterprise. And, subsequently, there was the task of issuing recommendations for their most efficient utilization within the Sumgait industrial center.

As we anticipated, significant possibilities were revealed for efficient utilization of fuel and power resources that are in short supply. According to preliminary calculations, in Sumgait as a whole during the years of the 10th and 11th Five-Year Plans more than 200,000 tons of conventional fuel can be saved. This will make it possible to reduce the consumption of natural gas in the center by an average of 5 percent and fuel oil--by 2 percent.

[Question] What are the recommendations and suggestions from scientists and are the Sumgait enterprises capable of putting them into practice?

[Answer] A typical example is the utilization of fuel resources from the organic products plant for heat supply for the enterprise. The implementation of this scheme will require the installation of a separator for liquid hydrocarbons. Our institute has developed its design. Its manufacture and installation will require insignificant expenditure--a total of 15,000 rubles. And because of this about 30,000 tons of conventional fuel will be saved. This is a large reserve. At other enterprises, particularly at the pipe rolling enterprise, the reserve for saving fuel lies in improving the operation of equipment. In order to solve this problem here and at other enterprises, it is necessary to install nonstandard equipment for recovering and utilizing secondary heat.

[Question] Is the entire problem a matter of where to prepare it?

[Answer] It would seem that it is possible to do this at many machine building plants of Baku. It is our common concern and machine builders must render assistance to Sumgait workers with this problem. And planning agencies should not stand to the side of this matter either.

[Question] Al'bert Yul'yevich, what specific assistance will the institute give regarding this problem? Or will you be limited to recommendations?

[Answer] Absolutely not. First of all, we intend to supervise the implementation of the measures that have been earmarked. Our institute is prepared, on a contractual basis, to make plans for transferring thermal and power resources from one enterprise to another. That same pipe rolling plant still discharges half of its secondary heat into the atmosphere. And it would be comparatively simple to transfer it to construction organizations that are located nearby. But it is necessary to have agreement among the various departments. And the main thing is common interest!

I wish to make a special point about the utilization of oxygen in Sumgait, for we have also dealt with this. As an analysis showed, the pipe rolling plant is experiencing a shortage of it for smelting steel. Yet more than half of the oxygen produced by the special station of the Orginstez association is discharged into the atmosphere because it is not needed.

Our institute has set the task of running an oxygen line to the pipe rolling plant and installing compressors there. This example shows especially clearly how harmful it is today to take a narrow departmental approach to solving any problem on the scale of an industrial center.

[Question] The managers of enterprises are talking about the fact that the utilization of secondary thermal and power resources requires large expenditures. Is this so?

[Answer] There is no doubt that their assimilation requires significant investments. One should not worry about money when we are talking about losses that

exceed possible expenditures dozens of times over. And if one takes into account that we are experiencing a shortage of power resources, the question of expenditures should not even be on the agenda. Moreover, the utilization of secondary resources involves a sharp reduction in the pollution of the environment.

Consequently, the attention of managers of industrial enterprises and leaders of economic planning agencies should be concentrated on a qualitatively new stage in the utilization of fuel and power resources on the path to creating closed technological cycles in which there should be no place for wastes of power resources!

[Question] The work that has been done undoubtedly makes it possible for you to discuss the scheme of the power supply for the Sumgait industrial center itself. Does it meet modern requirements?

[Answer] The scheme for the heat supply of industrial enterprises in Sumgait has essential shortcomings which, again, are frequently brought about by a narrow departmental approach to solving the problem of heat supply. Thus, the fabric for bulky yarn and outer knitwear which recently went into operation here has its own boilers while little more than half of the thermal capacities of city and thermoelectric stations are being used. Moreover, not far from these factories is a pipe rolling plant which discharges excess heat into the atmosphere. At the same time the thermal equipment and compressor equipment at the factories is loaded by only 25-30 percent. It would seem that it is necessary to change these enterprises over to centralized supply as quickly as possible and to give the thermal equipment that is in short supply to those who critically need it. The same operational solutions should be found for other questions of centralized supply of heat, electric power, gas, fuel and oxygen for enterprises of the industrial complex.

During the course of the investigation of the Sumgait industrial center, a large and significant amount of experience was accumulated whose importance it is difficult to overestimate on the scale of the entire country. Not much time will pass before the recommendations developed for Sumgait will be usefully applied in other industrial centers and will help to save a considerable quantity of secondary energy resources.

11772

CSO: 5000

DANGERS OF DRINKING WATER AT INDUSTRIAL ENTERPRISES

Kiev RABOCHAYA GAZETA in Russian 14 Jun 79 p 2

[Article by I. Yakushkin (Ternopol'): "Not That Fountain"]

[Text] They say that Charles Dickens took a gulp of hot water after every 50 lines of text he wrote.

But what would he have done if he lived next to the Ternopol' artificial leather plant? After all, this enterprise annually "swallows" more than 150,000 cubic meters for its industrial needs...and not industrial water, but that very drinking water which the eminent writer loved so much.

What does this mean?

In the first place, this means that the artificial leather plant takes in one-sixth of the water which our entire oblast center uses for household needs.

Second, this means that the plant managers are acting in violation of the Fundamentals of Water Legislation of the USSR and the Union Republics and the Ukrainian SSR Water Codex and they are not fulfilling the decree of the CPSU Central Committee and the USSR Council of Ministers "On Additional Measures for Increasing the Protection of Nature and Improving the Utilization of Natural Resources."

Third, this means that the plant director, Grigoriy Fedorovich Yakimishin, the head engineer, Grigoriy Rafailovich Ovchinnikov, and the chief of the heating and ventilation section, Yevgeniy Nikolayevich Muzyka, have a negligent attitude toward water. But water is speechless. It can only babble nicely and make fountains. But a fountain will not lead you to a protocol....

It is also known that a fountain is a beautiful sight in a mountain stream. But in a plant shop, it is clearly not the same fountain! And a protocol is very necessary here. One which would clearly determine when the artificial leather plant will finally be hooked up to the system for industrial running water and when it will stop brazenly "milking" the artesian well with its valuable drinking water.

The miraculous drinking water has been running strong for more than 30 years now at the Ternopol' plant where the director is Leonid Denisovich Korol' and the head engineer--Vladimir Il'ich Obukhovskiy.

It flows into the shop for cutting rock. It is used there directly and perniciously and a system for recycled water supply is not being introduced. The water comes not from the Seret from which it could be allowed to babble in, but from the artesian well. And more than 300 cubic meters a day flow into the city sewage system. It is not difficult to calculate that during a month this amounts to 9,000 cubic meters, during a year--more than 100,000, and during the 21 years during which Leonid Denisovich has managed the plant--more than 2 million cubic meters. And this is an entire lake of valuable drinking water which carp, pike and other living things could really inhabit.

There is also a fountain in the buildings of the first housing operations office of Ternopol'. There cranes use 18-20 percent of the water, each cubic meter of which costs approximately 8 kopecks. A trivial matter? Do not say that! It would be better for you to multiply these kopecks by those 200,000 cubic meters which flowed away last year without being used because of cranes that were in disrepair in the buildings of the city's housing operations offices. One obtains a solid figure: 16,000 rubles!

As numerous documents drawn up by workers of the state water inspection show, these wasteful fountains are also running in the shops of dozens of other enterprises, at construction sites and in communal places.

In recent years in our country and in other socialist countries, a number of legislative acts have been adopted which are directed toward improving the interrelation between society and nature as a whole and water supplies in particular. We are searching for more effective utilization of economic levers that are called upon to stimulate efficient water use. In Bulgaria and the GDR all measures for protecting the environment must be included in the plans of the enterprises. Their fulfillment is supervised on a level with production assignments and failure to fulfill them entails strict sanctions. Good? Undoubtedly!

It has long been time for Ternopol' and other rayons of the oblast to introduce strict accounting for the expenditure of drinking water and to develop norms and limits on its intake which industrial enterprises must introduce. And it would be very good if at enterprises, in densely populated places and other places where these pernicious water fountains are in operation, they were decorated in gold with the words: "save on water!" "when you leave your place of work or apartment turn off the water tap!" "water is the basis of life on earth. Save it."

"Punish us waterwasters!" The alarm would be sounded in the collectives of the brick plant, the artificial leather plant and other enterprises. But nobody cries out so self-critically here. The comrades have already become accustomed to the constant babbling of water at the watergates.

And yet, the people's control long ago should have given its authoritative word in defense of all kinds of water, especially drinking water.

11772

CSO: 5000

MONITORING CAR FUMES IN YEREVAN

Yerevan KOMMUNIST in Russian 14 Jun 79 p 4

[Article by A. Grigorova]

[Text] In our article the main role is played by figures--accepted, tolerable, unacceptable. Let us start with the fact that Yerevan is a city of a million. A fact that causes a feeling of definite pride. The well-being of the population increases steadily and as a reflection of it we have today in the personal use of the people of Yerevan 43,052 motor vehicles.

"Again the automobile!" says the reader with displeasure. "How much can be said about one and the same thing. We ought to rejoice that we live so well, that we are getting accustomed to convenience of movement."

The reader is right. We rejoice, when looking from the height of a balcony of a high-rise building at the multi-colored motor vehicles moving in a continuous stream along surrounding streets and standing below in the parking lot. We rejoice in the rainbow of colors. Contented, we enumerate: here is someone else who has applied for a machine.

Now for some tolerable figures. They start with GOST 17.2.2.03-77, newly issued by the State Committee for Standards of the USSR Council of Ministers. It is entitled, "Preservation of nature. The atmosphere. Content of carbon monoxide in the exhaust gases of motor vehicles with gasoline engines. Standards and methods of determination." As has become known from a conversation with I. Rustomyan, section chief of the State Inspectorate of Environmental Quality of the republican service of the State Committee for Standards, the new GOST became effective in July of last year but in practice the old standards are still being adhered to in the enterprises of the city.

The standards of the new GOST are clearly defined: the percentage content of carbon monoxide in exhaust gases must not exceed 3.5 percent for motor vehicles made before July 1978, 2 percent for those made after that date and 1.5 percent for those made after January 1980. That is, the motor-vehicle industry is trying to improve the manufacture of engines and other

motor-vehicle parts, in accordance with the drive for purity of the atmosphere. And those guarantees are already reflected in the GOST. And what else?

The GOST also entrusts the checking of the carbon monoxide content in exhaust gases to enterprises operating motor vehicles for service use, to State Motor Vehicle Inspection (GAI) services, technical service stations and motor vehicle repair enterprises for motor vehicles of the given sector.

But before turning to all those instances we acquainted ourselves with the figures and conclusions which regarding our city are available in the Administration of the Hydrometeorological Service and the Ministry of Health of the republic. It was made clear that as regards three ingredients (carbon monoxide, nitric oxide and phenol) the contamination of the air of the republic's capital exceeds the limits of the allowable concentration. All those compounds are highly toxic and by virtue of the relief of the city and high solar activity promote photochemical processes and the formation of smog. It can be observed in cloudless weather from the Norkskoye or Kanakarskoye plateau and can be smelled in the peak hours at any busy intersection. In that sense calm days become a plague. There still have not been any substantial advances toward improvement, if one does not take into consideration the fact that the total "atmosphere" improves in traffic safety month. This is recorded by instruments. It means the city can be helped!

The Visual Method and Smoky Exhausts

The smoky exhaust behind a machine has become common, but not many know that there are differences between such exhausts. Incomplete combustion causes a dense black smoke containing soot that pours over the passengers at halts behind the "Icarus." State motor vehicle inspection workers race after "KRAZ" and "MAZ" heavy trucks when they see a black cloud. However, it is precisely those heavy machines using diesel fuel that are less dangerous to the environment. A diesel engine discharges into the air less carbon monoxide than a gasoline engine. Heavy fuel contains less of other hydrocarbon residues than high-octane gasoline used by the "Zhigula" or "Voiga."

And so gigantic multi-tonnage trucks servicing the subway builders and the numerous passenger buses are not the greatest evil, it turns out. When the a motor vehicle inspectorate inspector stopped a "MAZ" with reinforced-concrete shells for the Arpa-Sevan tunnel, turned it into a garage and took its number, no large gain, moral or material, was achieved. The reloading of the shells required time and additional expenditures. The work schedule was disrupted at the "Arpasevanstroy" start-up shaft. Until it was put in order the machines stood idle in the parking lot and the losses increased by a geometric progression. But the smoky exhaust from the diesel was too noticeable and could not get past the motor vehicle inspector, as we see.

But at that same moment tens of light machines with a blue exhaust, far more dangerous to the environment, slipped past him.

But what about the motor vehicle inspector? He has at his disposal a visual method of determination, in which the diesel smoky exhaust is ponderable and direct, and the exhaust from AI-93 gasoline is almost a mirage. I would not like to believe that the motor vehicle inspectorate of the republic and its municipal subdivisions do not have available diagnostic apparatus for determining the toxicity of exhaust gases in either a portable or nonportable variant. It is improbable, but a fact. There are no portable "suitcases," which are very convenient for an inspector to have on the highway. The motor vehicle inspection service also does not have its own diagnostic stations. It is necessary, even during technical inspection months, to resort to the help of services of the State Committee for Standards and the service stations which have such apparatus available.

In addition, in the Statute on rights and obligations of motor vehicle inspection workers there are no clear, specific indications on the subject of combatting the toxicity of exhaust gases. There is no special apparatus, practically no rights to detain motor vehicles. Following local decisions and resolutions on preservation of the environment (and up to 20 of them have been issued by directive offices in the last 3 years) the motor vehicle inspection workers halt machines using the visual test. That method hardly provides an advantage.

Very radical attempts were made in March of this year, when the resolution of the Ispolkom of the Yerevan gorsoviet on joint measures to verify the toxicity of exhaust gases was implemented. A month of efforts by the workers of the state motor vehicle inspection service and the State Committee for Standards brought the following result: as a result of spot-checking it was found that 82 percent of halted machines for individual use had high carbon dioxide contents in their exhaust gases. But how is the poisoning motor vehicle to be found in that large number of machines?

Concerns of the Motor Vehicle Service

For a start we had our machine checked for CO (carbon monoxide) at the first service station (it turned out to be STOA-2 of the Yerevan Zonal Association under the Main Administration of Motor Vehicle Technical Servicing. It proved to be safe, as the instrument indicator did not go off the scale.

The spirit of the times in the sense of concern about the air of the city was reflected in the form of the "record book" on the CO content in machines coming in for servicing. The following was recorded in the book: on the preceding day, 23 April, four motor vehicles were inspected and regulated. And today there have been two so far. The driver is issued a card stating that at a certain station at a certain time he passed an inspection for meeting the CO standards. The card is signed by the senior foreman of the service station. On the road a motor-vehicle inspector can demand the card.

It would seem that everything is simple. But far more machines visited the station for technical assistance today, yesterday, etc, and only the very conscientious agreed to measurement of the carbon monoxide. Not because the drivers were unwilling to pay a ruble for the test. They fear the consequences. If the carbon monoxide is not within the standard, regulation, adjustment or repair is required, and that means additional expense. And in all the instructions it is written that "the inspection of individual means of transport at stations will be done at the request of the owner." And still...

The spirit of the times. At the Yerevan (khozraschet) station with 25 work places it turned out somewhat differently. They do not keep record books there but have proceeded along a more energetic path: all machines coming in for any repairs are monitored for carbon monoxide. Pay a ruble in advance and be inspected, otherwise they will not repair your headlights, will not check your brakes, etc. The method is compulsory but achieves some effect. The one-ruble notes pour in and the violators are determined. But each of them is free to depart without regulation and without a card. By 1400 hours on 24 April 42 machines had been checked for carbon monoxide; 23 of them were within the standard and the drivers received corresponding cards, 17 departed without a card, having refused regulation and, of course, being potential "poisoners."

And here is where the circle closes. The owners of machines cannot be forced to accept the services of the motor vehicle service. The State Motor Vehicle Inspectorate, when a driver without a card is stopped, also cannot visually determine his guilt. The machine departs...

Departmental Interests Lag

What are they?

For the State Motor Vehicle Inspectorate, to have a diagnostic station. The management of auto inspection of the republic insists on it. However, if one starts from the general state interests, that solution is not logical. The equipment of such a station will require capital investments of almost a million rubles. A costly measure, when we have diagnostic equipment at all "Avtotekhnoslužhivaniye" stations. Two stations in Yerevan have excellently equipped stands, but one of them does not work at all. During the entire year of 1978 a total of six machines were technically inspected on that stand at the station. Up to 10,000 motor vehicles did not undergo the set technical inspection at all last year. These facts permit drawing corresponding conclusions.

Why multiply the number of inoperative diagnostic stands? For the motor-vehicle inspection service, having discovered a violation on its stand, does not start to regulate and repair but directs the machine to various places in the same motor vehicle service. Not duplication, but joint efforts. That is the way out of the problem. Workers of the State Motor

Vehicle Inspectorate must be equipped with portable apparatus capable of determining a violation on the spot.

There also is another aspect of the problem. The card or certificate issued to the driver by the motor vehicle service is not at all an "indulgence" for the future. During the time the quality of AI-93 gasoline was spot-checked in Yerevan gas stations Nos 1 and 8, in a period of one month it was found that the gasoline did not meet the GOST. A driver who has just filled his tank with that gasoline and who had just received a certificate would poison the air all the way home.

Today it is better to "control" the toxic discharges of very large plants and factories than to trace the flow of elegant machines. There can be many solutions. But the most radical is to make specific the control rules and instructions for workers of the State Motor Vehicle Inspectorate for exhaust gases. The responsibility of owners of personal transport for technical maintenance must be increased. Needed is very widespread dissemination of information about the population and explanatory work along the line of the Automobile Club. And strict measures to prevent violations.

There is a wide assortment of measures to protect the air of the city. That closed circle includes measures that depend on each citizen, owners of machines and tens of departments down to the gorsoviets. As an example of this, in conclusion we will cite some figures directly related to our city. Poplars are in bloom. The biologists and hygienists call that tree the "oxygen factory." In ability to purify the air of carbon monoxide and enrich it with oxygen the poplar is the champion among trees; it renders harmless as much carbon monoxide as three linden, four pine or seven spruce. In recent years many poplars have been cut down in our city. How many will never be known. A month might be proclaimed and each of the 45,052 owners of motor vehicles forced to plant one poplar each. Perhaps with such a small detail each would start to become aware of the seriousness of the problem.

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CSO: 5000

STRONG FLOOD AT SAYANO-SHUSHENSKAYA GES DAM

Moscow TRUD in Russian 23 Jun 79 p 2

[Article by V. Lisin]

[Text] A strong flood has fallen on the Sayano-Shushenskays GES dam. The people courageously met the onrush of the elements. They withstood it and they won, curbing the wilful Yenisey. Now, when the water has subsided, not only the heroism of the people is seen more clearly, but also definite miscalculations made in the period of preparation and passage of the flood. This is discussed in the report of our correspondent from the Sayano-Shushenskaya GES construction site.

Such a thing is not forgotten for a long time, and I see it now: the crest of the Sayano-Shushenskaya GES dam. A flood. Directly below me, it seems that you can stoop and reach it, is the turbid surface of the reservoir, apparently so harmless and quiet.

And then the stream of water arrives with a roar like thunder. Falling from a dizzy height, it breaks against the unfinished blocks of the lower stages, twists around, rises in fountains, boils up like milk. A flood...

We were expecting that flood. We had prepared for it a long time, but it came unexpectedly, literally like a storm. A warning had come from Krasnoyarsk to the construction site on 19 May: expect a sharp rise of the water level in the next 3 days. It would appear that the temper of the Yenisey had been studied. The specialists had been observing it since the start of the present century. But the river, which had hitherto behaved relatively peacefully, suddenly rose in rebellion, literally sensed the latter possibility and burst out of the curbs that people had imposed on it.

In a year in the Karlovskiy section the Yenisey carries through 46 cubic kilometers of water, 18 of them in the time of flood. A severe winter with much snow, a lagging spring and then a sudden thaw with abundant rains did everything to make the Yenisey furious. Instead of the predicted two stages of flooding, almost a month apart, the powerful Siberian river gathered its forces into a single fist.

The water arrived almost before our eyes. Already on 20 May it went through two openings in the dam and the open spillway. Even in the morning the flow of water was not more than 3,000 cubic meters per second, and by evening it had reached 4,500, on 21 May it was already 5,000 cubic meters, and on the 22nd even higher. Moreover, the flow of water not only went forward but also was hurled 30 meters to the side. No one had expected that. The water started to enter the GES boiler building through the distribution wall. The threat of flooding hung over the first unit, started by the builders in December of last year.

In those days the personnel at the construction site forgot about rest. Work at the dam was not halted, although that was possible.

"Concrete, give us concrete," demanded the teams of Yu. Vanchagov, M. Mashchenko and N. Kazhin, who were working then on the hottest part of the dam, the spillway part. Then more and more often the words would come over the telephone:

"No need for concrete now. The block is being flooded. We're leaving..."

The concrete delivery scaffold was directly below the spillway. The stream of water, thrown down from a height, with each day gathered force and matched it more and more closely. It was not sprinkled but was wrapped with a wet white covering. The concrete mixers proceeded with their headlights lit and movement was regulated by means of a radio station. But it began to spray on the scaffold. Only the bold set off on the path. A "MAZ" started and after a minute turned back; it was frightful. A "ZIL-157" set off. The way was blocked by a beam. Then the driver tried to remove the beam from the road, and water got into the engine. The engine died out. The driver, who had dismounted, returned to the bank on foot. That was the last trip. The Yenisey soon hurled the machine from the scaffold like a toy.

It was 22 May. About 3,000 cubic meters of concrete had been laid with crushed rock--a bright example of the courage and strength of the hydro-builders.

At that time a struggle to save the first unit began. The deputy chief engineer of "Krasnoyarskgesstroy," V. Gubarev, proposed building up the wall separating the foundation area from the spillway with 22-ton beams. He ran to the place to see how to do it best. But on the road the stream of water pouring to the side knocked him from his feet, drawing him with it. At the last moment V. Gubarev succeeded in seizing a metal structure.

The staff understood that that alternative had to be given up. The water gushed into the foundation area like a river. Pumps at the disposal of the builders and fire engines that came to their aid could not handle the situation. They decided to erect a wall in the foundation area to enclose the first unit. The people worked in cold water, tied together so that they would not be washed away. But it was beyond human powers to cope with all

the arriving water. At 1000 hours on the morning of 23 May the staff decided to evacuate the most valuable equipment from the machine room and and to save the unit. A little earlier the chief of construction, S. Sadovskiy, had addressed the collective by radio, saying: "I ask all to remain at your workplaces, even if the shift ends." None left the dam.

At that critical moment, when the flow washed away before one's eyes, as if it were made of paper, a large underground crane, and when the machine room of the first unit and various equipment proved to be under water, no people were lost. They opposed the elements with strength and courage and battled with the Yenisey for each centimeter. But under those conditions the main thing was the safety of the people. No one was lost during the flood at the dam.

The reservoir level, meanwhile, had risen threateningly. The stream could start to flow over and across the station part of the dam, where all the machinery and equipment was. They started to raise the shutters (temporary metal partitions in the body of the dam that blocked the path of the water). In section 41, no matter how they tried, they could not. It was decided to use explosives. That was entrusted to V. Kosinov, chief engineer of the "Gidrospeksstroy" Administration. He had to have great boldness, comprehension and endurance to bring pontoons containing explosives to the necessary place from the direction of the reservoir.

Now, when you read these lines, the flood still roars in the Sayany. More than 4,000 cubic meters of water pass through the dam every second. This is far less than in the last days of May. But the elements, as before, represent a menacing force.

In those difficult days at the construction site the laying of concrete was not halted for a minute. In spite of the fact that the flow smashed the main concrete-bearing artery, the transport scaffold, on a right-bank notch, where it was still possible to pass, the teams of M. Poltoran and M. Mekhanoshin were working. In the course of a week a new concrete transport path was constructed along the left bank. In the next few days on the right bank the tunnelers will cut a transport tunnel and concrete will arrive at the dam through it. The rates of concrete laying are increasing steadily.

A few days ago the Yenisey was pouring up to 35,000 cubic meters of water per hour into the foundation area of the GES building. That was twice as much as the hydro builders could pump out. In 7 days, risking their lives in a roaring cascade, 20 volunteers erected a water-dividing wall under the supervision of Z. Dolbin. The flow of water swept away bags of cement as if they were matchboxes. But the people proved to be more persistent than it: the path of the Yenisey into the foundation area was closed. The water began to be pumped out. Soon the first hydro unit will be free of river water.

"The flood created many difficulties for us," the chief of the "Krasnoyarskgesstroy" Administration, S. I. Sadovskiy, told us. "But the hydro builders are confident that the obligations of the present year will be fulfilled in spite of that. Two more hydro units will go into operation. There are real possibilities of that, and we will use them."

Yes, this year's flood became a serious test for the hydro builders. For the first time in Soviet practice it was passed by a spillway through a structure under construction. Until last year the Yenisey passed through 10 bottom openings. But before the first unit was started it was closed to fill the reservoir. It was decided to pass the flood through openings of the second stage.

As the chief of Glavvostokgidroenergogostroy of the USSR Ministry of Power and Electrification, G. Maslovskiy, thinks, "we encountered a phenomenon not worked out by scientific and engineering thought." However, it is the opinion of the chief engineer of the Sayano-Sheshenskaya GES project, A. Yefimenko that: "Everything would have been different if the builders had done the work in accordance with the plan." Others think that the meteorologists are to blame for making an imprecise long-range forecast that led scientists into error in modeling the flood under laboratory conditions and did not predict its consequences of the present day.

It is difficult to determine who is right. Evidently there are grains of truth in each of those opinions.

It cannot be said that this year's flood is unprecedented on the Yenisey. In calculating the passage of the flood the designers used a water flow rate of 13,500 cubic meters per second, that is, almost twice as much as it had recently been. A model of the dam was tested with that flow rate taken into consideration in the Scientific Research Institute of Hydraulic Engineering imeni Vedeneyev. But the scale was rather small: 1:100. On a larger model all the negative phenomena--strong aeration (saturation with air) of the flow and powerful ejections of water to the side--probably would have been more distinctly visible. But it still does not seem possible to conduct such tests: the high-pressure laboratory constructed in Divnogorsk and intended mainly for modeling the work of Siberian hydroelectric power stations is not yet in operation.

But even in that case it was impossible to orient oneself solely on a model: it far from completely corresponded to the configuration of the dam through which the flood passed. The initial plan for water passage was re-worked many times, not because it was a poor plan, but because the builders simply could not erect the structure strictly according to the plan.

The readiness of a dam for a flood is determined by the quantity of laid concrete. The builders did a great deal--they succeeded in bringing the pressure front of the dam to the planned marks. But they lagged seriously in its spillway part.

In recent years the "Krasnoyarskgesstroy" Administration has not fulfilled the annual plans for the laying of concrete. In the past the lag has amounted to 200,000 cubic meters. This time in the period of preparation for the flood it was necessary to lay 340,000 cubic meters, and almost 100,000 cubic meters less were laid. The water was to pass through six openings and four open spillways. But it went through three openings, one completely and three partially open spillways. The main reason for this was that mechanisms for raising the gates and shutters had not been installed in time and a number of sections were not ready. Add to that the fact that the first unit was detached and that they could not open the emergency repair floodgate--it was blocked by construction trash.

For the flow to proceed in a more organized manner it was necessary for the distribution piers--enormous concrete columns in the lower part of the dam--to be made 20 meters larger. However, that also had not been done. There also were other deviations from the latest variant of the plan, issued literally on the eve of the flood.

The situation with author's inspection at the site cannot be considered satisfactory. The planners write instructions, but often they are not fulfilled. It suffices to say that the content of the author's inspection journal at the "Krasnoyarskgesstroy" Administration has not been discussed even once recently, and in the first administration of main equipment they have lost it completely.

Of course, the main conclusion why the flood was passed through in such a disorganized manner is drawn by the specialists. But it is already clear now--the Yenisey has reminded us too many times that it does not tolerate familiarity. Therefore now, at the height of the present flood, in the construction administration they are already thinking about the passage of the flood of a future year. The Yenisey has taught them a lesson.

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CSO: 5000

CONSERVATION IN ASBESTOS-CEMENT ENTERPRISES

Moscow STROITEL'NAYE MATERIALY in Russian No 1, Jan 79 pp 19-20

[Article by Candidate of Technical Sciences L. V. Medvedeva, Engineer L. S. Grishina, Candidate of Technical Sciences V. A. Komarov and Candidate of Technical Sciences O. I. Gracheva, All-Union Scientific-Research Institute for Planning in the Field of Asbestos Cement; Engineer G. N. Venetskiy; Engineer A. P. Pilipenko, Khar'kov Plant for Insulating and Asbestos-Cement Materials; and Engineer R. A. Ivanova, Alekseyevsk Combine for Asbestos-Cement Products: "The Experience in the Use of Circulating Water-Supply Systems in Asbestos-Cement Enterprises"]

[Text] The introduction of closed cycles in the recovery of technological water in asbestos-cement enterprises makes it possible to put back into production a significant amount of raw material which ordinarily would be ejected at the time of blowing through the recovery units; and also to preserve a clean state in closed reservoirs. Nevertheless, the use of closed cycles in a number of instances produces some reduction in the productivity of molding machines, and also an increase in the fracturing of asbestos-cement sheets.¹ Despite an attempt to explain these phenomena^{2, 3}, no final conclusions have thus far been reached.

Since 1972 a closed system of technological water recovery based on the recovery unit-settling tank-recovery unit scheme has been in use at the Khar'kov Plant for Insulating and Asbestos-Cement Materials and the Alekseyevsk Combine for Asbestos-Cement Products. To make an initial evaluation of the quality of the technological water used at those enterprises, we ran laboratory tests on the degree of ion-saturation of distilled water solutions of Alekseyevsk and Balakleya cements (the latter serves as raw material for the Khar'kov Plant). The tests were conducted to simulate as closely as possible the production conditions in which saturation of the liquid phase by ions entering the solution from cement occurs.

Curves illustrating the kinetics of ion saturation of solutions by Alekseyevsk and Balakleya cements are shown in Fig. 1. Ion concentration

of the solution depends basically on the chemical and mineralogical composition of the cement.⁴ The laboratory experiment used in studying ion concentration in the liquid phase of cement suspensions showed that the maximum concentration in the case of Alekseyevsk cement suspensions in a state of saturation* is not high; while, given the same conditions, the concentration of salts in a Balakleya cement suspension is significantly stronger. The results of this research support the conclusion that it is precisely the low concentration of salts in its technological water which enables the Alekseyevsk combine to function with a closed cycle of technological water recovery.

The concentration of salts in a Balakleya cement solution being significantly higher, the question of the adoption of a closed cycle of technological water recovery in this case can be decided only by experiment.

In the process of our industrial tests we studied the technological water recovery system, analyzed chemically both the water and the cement, and monitored the operational parameters of the sheet-molding machines, their productivity and the quality of the finished product.

Figure 2 illustrates the circulating water supply system in use at the Khar'kov Plant. Practically the same system is in use at the Alekseyevsk combine, the only difference appearing in the relative positioning of the six sections for settling suspended substances in technological water from the plant; at the Khar'kov Plant, tap water is directed into the clean recovery unit and sedimentation tank. It should be noted that at both these plants the vacuum pumps are operated on clarified technological water. Both systems represent closed cycles of technological water recovery.

For the purposes of chemical analysis, water samples were taken from the hydrofluffer, the recovery unit, the ladle agitator and the sedimentation tank. Ion content of the water from hydrofluffer and agitator (within the limits of error of the experiment--5-10 percent) coincided with that of water from the recovery unit. Comparison of the results of production and laboratory analyses of the water showed that the chemical content of the liquid phase in saturation conditions in the laboratory tests corresponds to the chemical content of the technological water of the industrial enterprises studied (Fig. 3), within the limits of error of the tests. Water emerging from the sedimentation tanks showed a lower concentration of salts than did that delivered to the tanks.

Since the sedimentation tank is located outside the plant building, temperature of the water drops as it proceeds from section to section. Thus,

*The term "saturation" means the maximum value of the equilibrium concentration of ions entering a solution from cement.

in sections 1-6 of the Khar'kov Plant sedimentation tank, water temperature drops from 34 to 28°C when there is a surrounding air temperature of +18°C. Temperature of water in section 4, from which it is returned to the plant, is approximately 7° below that of water entering the sedimentation tank (34°C).

Industrial Enterprise	Degree of fluffiness of asbestos, percentage		Humidity of film percentage		Humidity of sheet, percentage	Hourly productivity of machines (arbitrary area units)	Bending strength limit, kgf/cm ²	Density, g/cm ³
	In rolls	In colander	Before vacuum	After vacuum				
Khar'kov Plant	31	78	41	32	21	5,500	175	1.77
Alekseyevsk Combine	30	83	48	35	23	4,150	170	1.6

In view of the results of earlier research⁵, it can be assumed that as a result of steady lowering of temperature of water in the sedimentation tank there is recrystallization of salts from the supersaturated solution and this leads to reduction of the concentration of certain ions in water and reintroduced into production. In addition, owing to contact between the solution in the sedimentation tank and the atmosphere, there occurs carbonization of calcium, as a result of which the content of Ca²⁺ and OH⁻ ions is reduced. The presence of calcium carbonate in the sediment of the tank is confirmed by x-ray analysis.

The same processes occur in the sedimentation plant of the Alekseyevsk combine, though in this case tap water is periodically introduced. Reduction in the ion concentration of water returning to production from the sedimentation tank is favorably reflected in the process of molding the products of the plant.

Comparison of the technico-economic indices of the operation of the two enterprises (see table) shows that, with practically identical quality of product, the productivity of the molding machines of the Alekseyevsk combine is more than 20 percent lower than in the case of the Khar'kov plant.

This is the result of the low quality of the cement used, which, in a number of instances, does not measure up to the requirements of State Standard 9835--66.

Thus, study of the operation of the Alekseyevsk combine and the Khar'kov plant has shown that the use of a circulating water-supply system based on the recovery unit-sedimentation tank-recovery unit principle over an extended period enables industrial enterprises to function with high productivity of sheet-molding machines and to turn out a product which meets existing standards. In the case of the Alekseyevsk combine, the productivity of molding machines can be raised by approximately 20 percent by stabilizing the quality of the cement used. This positive experience can be recommended for application in related enterprises of this branch of industry which are making use of cements of similar chemical composition.

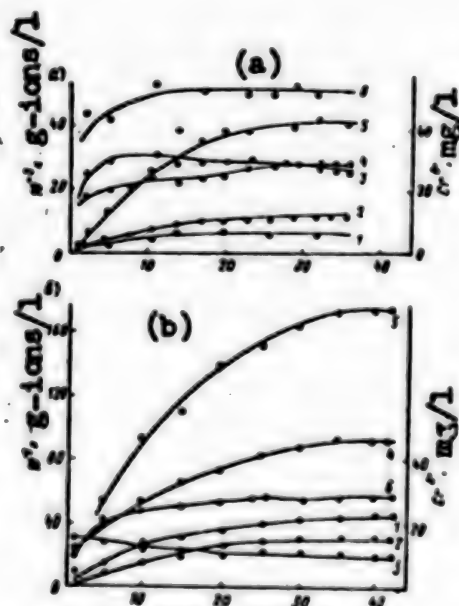


Figure 1. Curves of saturation of distilled water by ions from Alekseyevsk (a) and Balakleya cements. (Same for Figure 3).

1 - CR_6^+ ; 2 - Na^+ ; 3 - Ca^{2+} ; 4 - SO_4^{2-} ;
5 - K^+ ; 6 - OH^-

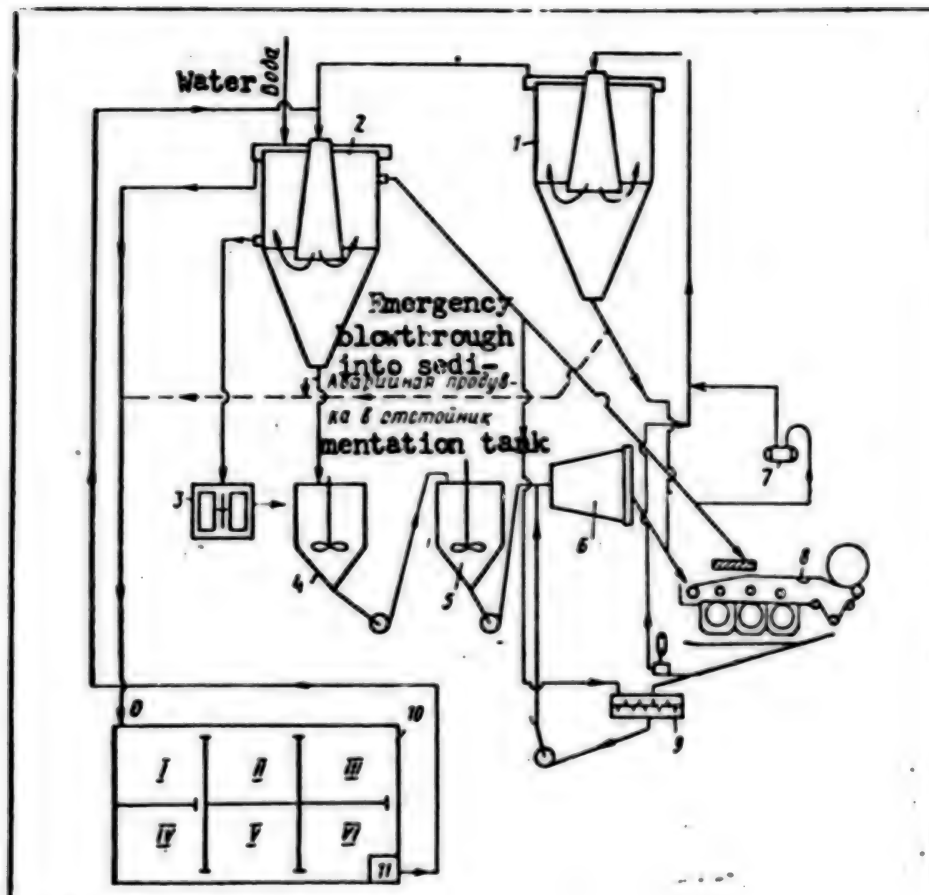


Figure 2. Schematic representation of the circulating water-supply system of the Khar'kov Plant for Asbestos-Cement Products.

Key:

- | | |
|---|--------------------------|
| 1, 2. recovery units for chemically contaminated and pure water | 8. sheet-molding machine |
| 3. edgerunner mills | 9. waste mixer |
| 4. hydrofluffer | 10. sedimentation tank |
| 5. mixer | 11. pumping station |
| 6. ladle agitator | |
| 7. vacuum pump | |

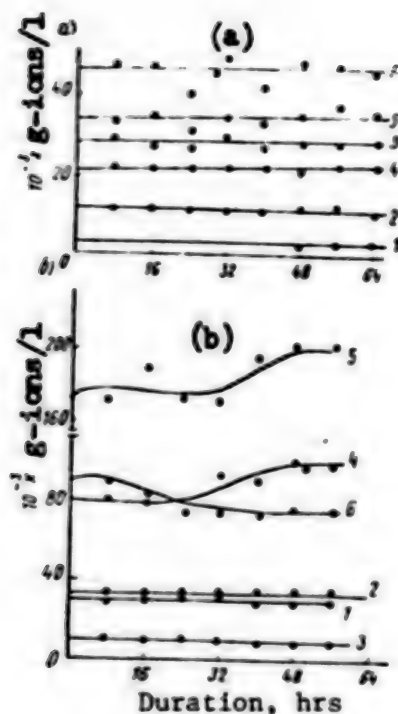


Figure 3. Ion composition of technological water from the recovery units of the Alekseyevsk combine (a) and the Khar'kob plant (b).

FOOTNOTES

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BOOK ON COMBATING CONSTRUCTION NOISE AND VIBRATION

Kiev RABOCHAYA GAZETA in Russian 22 Jun 79 p 2

[Article by L. Timofeyenko, candidate of technical sciences, section head of the Scientific Research Institute of Construction Production of the Ukrainian SSR Gosstroy]

[Text] In the last 20 years the noise level in construction production has approximately doubled. This has occurred mainly because of increase of the power of machines and mechanisms and increase of the power available per unit or worker of construction sites and enterprises of the construction industry. That process continues. However, noise exceeding the allowable standards causes fatigue, reduces labor productivity and can even lead to diseases of the cardiovascular system or the gastrointestinal tract.

How are builders to be protected against the harmful effects of noise? This is discussed in the book by Ye. P. Samoylyuk and V. V. Safonov entitled "The Struggle Against Noise and Vibrations in Construction and at Enterprises of the Construction Industry" [Bor'ba s shumom i vibratsiyey v stroitel'stve i na predpriyatiyakh stroitel'noy industrii], published by "Budivel'nik" izdatel'stvo.

The book contains generalizations of the results of work of many research and planning organizations on questions in the struggle against noise and vibration, the noise characteristics of machines and mechanisms and much else.

Of especially great importance for practical application are methods of noise reduction described in the book. It is not enough to know how much a given noise exceeds the sanitary standards. It is more important to find a way to reduce it. Thus, the method of sound absorption is frequently overrated in practice, although with sound insulation it is possible to achieve a result 6-10 times more perceptible. In addition, sound absorption can give an effect only for a definite spectrum of noise, and at times this is not taken into consideration.

The authors of the work examine in detail the advantages of different methods and give recommendations for their application. But they turn special

attention to the most active method of noise reduction--at its source. This method must be made available to the planners of construction machines and mechanisms, as it is in their power to select the least noisy technological processes and working conditions.

Also discussed in the book are many other questions encountered at construction sites, reinforced concrete articles plants and woodworking combines. Therefore it will become a useful aid for engineering and technical workers of construction and planning organizations.

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BRIEFS

WATER PURIFICATION--(TASS)--A cascade of purification stations will protect the Velikaya River, the main water channel of the oblast, against contamination. A group of 25 facilities erected near Pskov has begun to receive industrial and household waste waters. It is capable of removing impurities and enriching with oxygen 80,000 cubic meters of water a day. All rayon centers situated along the river and on its tributaries, and also large farms, will receive these "pure water factories." A group is already in operation in Pushkinskiye Gory, and at the end of the summer the purification equipment of the village of Palkino will start working. [Text] [Moscow SROITEL'NAYA GAZETA in Russian 13 Jun 79 p 2] 2174

BACTERIA PURIFY WATER--Kiev. Bacteria strains developed by scientists of the Institute of Colloidal Chemistry and the Chemistry of Water of the Ukrainian Academy of Sciences are capable of rapidly rendering harmless toxic substances of waste waters. The new microbiological method of purification makes it possible to completely intercept harmful volatile substances. [Text] [Moscow GUDOK in Russian 15 Jun 79 p 3] 2174

LAKE IS SAVED--Kurgan, 5 Jun (TASS)--The famous Lake Gor'koye in Zaural'ye has become full of water again. The people saved it from drying up. And it all started with the fact that the workers of the "Sosnovaya rushcha" (Pine Grove) Sanatorium, situated on the shore of the lake, noted a consideration lowering of its level. Specialists of the Kurgan "Giprogorssel'stroy" Institute discovered large reserves of water deep under the lake with the same chemical composition as the waters of Gor'koye. After a well was drilled in the lake it began to receive 12,000 cubic meters of water a day and its water level returned to its previous position. [Text] [Moscow PRAVDA in Russian 6 Jun 79 p 3] 2174

PROTECTION OF WATER--In the Belorussian Scientific Research Institute of Sanitation and Hygiene the work of an excursion plenum of the Section for Water Hygiene and the Sanitary Preservation of Reservoirs of the Problem Commission of the USSR Academy of Medical Sciences has completed its work. It discussed problems of the influence of chemical factors of water on the state of health of the population, and also the repeated use and purification of waste waters, their protection against contamination and other questions about the rational use of water resources. Participating in the work of the

plenum were leading scientists of the Institute of General and Municipal Hygiene imeni A. S. Sysin of the USSR Academy of Medical Sciences, the Moscow Scientific Research Institute of Hygiene imeni F. F. Erisman, the Kiev Institute of General and Municipal Hygiene imeni A. N. Markevich, the First Moscow Medical Institute imeni I. I. Sechenov, the Omsk, Saratov and L'vov medical institutes, the Uzbek Scientific Research Institute of Sanitation, Hygiene and Occupational Diseases and other scientific institutions and organizations. [Text] [Minsk SOVETSKAYA BELORUSSIYA in Russian 9 Jun 79 p 3] 2174

EARTHQUAKE STRIKES CENTRAL ASIA--Tashkent--Today at 1456 Moscow time the central seismic station "Tashkent" registered an underground tremor in Uzbekistan registering 4 on the 12-degree scale. The epicenter of the earthquake was situated 520 km to the south of the capital of Uzbekistan, near the Afghan town of Feyzabad. There, in the spurs of the Hindukush range, the force of the tremor exceeded 5 degrees. Tremors of approximately the same force of 3 to 4 degrees have been registered over an extensive area of territory of Soviet republics in Central Asia. There are no casualties or damage. [Text] [Moscow TASS International Service in Russian 1750 GMT 20 Jun 79 LD]

CSO: 5000

EUROPEAN ENVIRONMENTALISTS JOIN IN DEMAND FOR EC ACTION

Stockholm DAGENS NYHETER in Swedish 7 Jun 79 p 40

[Article by Birgitta Nyblom]

[Text] In connection with the election to the EC Parliament, environmental activists in 11 countries have signed a manifesto in which they demand a different kind of Europe, an Ecoropa. In such a Europe, an effort will be made to build an ecological society (ecology is the study of the interaction between people, animals, and nature). With the manifesto, the environmental activists are trying to make EC politicians and voters see that future policy must build on ecological principles alone and not on political ideologies.

Europe needs politicians who can break the ice and see which way the wind is blowing. They must be capable of understanding that the new and coming policy cannot rest on socialist, liberal, or conservative ideologies, but on ecological principles alone. This is stated in the environmental activists' manifesto for a different Europe, an Ecoropa. They also want an ecological world order.

The manifesto was available from Manfred Siebker of Brussels at the Friends of the Earth conference on soft forms of energy at the University of Rome during the end of May. He is an ex-atomic physicist who quit Euratom and is now a member of the Rome Club.

The ecological manifesto for a different Europe is now being spread to voters and politicians before the direct election to a common EC Parliament.

"We must reach down to the grass roots," he says. "We see centralization everywhere. This goes against the basic idea of democracy. Nuclear power is fatal. The people must get direct information. We must make it through the crisis, not reinforce it."

Manfred Siebker's goal is to make the future visible. He was in Euratom from 1959 to 1973 and is now ecologically active in the Ecoropa movement. There were three reasons that made him change sides, he says.

"I discovered that the risks involved with plutonium were greater than what was admitted. Plutonium slowly enters every living thing."

"I found that the nuclear industry and the Radiation Protection Institute had given false information on the risks of radiation. The institute functioned undemocratically."

"In 1970-1971 I was going to travel abroad. I was asked about my political reliability, my family's political views, and what vacation spot I was going to visit."

Whose Needs

"All the propaganda is based on the idea that we need energy to have jobs and a good life," he says. "This is wrong. All energy demands that have been studied have to do with the political need. But this is not the people's need."

"More and more Europeans today are convinced that the path we are now following will lead deeper and deeper into unemployment and inflation and will lead to energy crises. Radioactivity may spread and there may be an armed conflict between north and south. After 200 years of industrial development we have now come to the crossroads."

"This is stated in the manifesto and the decision makers in politics and economics are feeling it. This can possibly mean that we will get new politicians and new entrepreneurs who belong to the grass roots with a strong consciousness and self-reliance," says Manfred Siebker.

"How will we overcome the technocracy which is dominant today," he asks in the manifesto, which is the result of discussions among interested citizens of 11 European countries.

"More and more people of different ages with various backgrounds and training are now trying to change their lives. There are already millions of them in Europe. But they are running up against this faceless technocratic complex. It is attempting to paralyze their initiative, their hopes, and their self-reliance."

They are now in the process of uniting across boundary lines. They are uniting in groups, movements, or class-interest groups. A new spirit is arising.

The manifesto also presents a picture of how the future will look if the present technocracy is allowed to rule. It shows an even closer connection between centralized energy systems (primarily nuclear energy) and military power and police control.

"Everyone should have a meaningful job," says Manfred Siebker. "People today do not have that opportunity." In this case, people cannot be creative during their free time. In an ecological society that functions well, a person does not work to gain power or money under the table. In a society where people do not have meaningful jobs, they are tied to consumption and the resources of nature and humans are destroyed.

The author of the manifesto wants a society of non-specialists. It will not be ruled by experts. But it is only possible to deprogram experts if they possess general knowledge. And, what is more important, if they can implant this knowledge in the grass roots.

Training

It takes training to think in ecological terms, to work with small institutions, and to educate a society to self-reliance. New, permanent training will instill this knowledge and skill, which will be able to rapidly meet the growing demand from society and individuals.

"In the ecological society, the foremost principle is to protect life. But the political scene in Europe is like a frozen sea, where the winds of change do not create any waves," the manifesto states.

"Political parties, to a high degree, have become strict hierarchical systems that function for their own sake. They monopolize the political scene and, in this way, oppose democracy. They destroy people's motivation.

We need politicians who have a tendency to break the ice, who heed the new winds—politicians who understand that, now and in the future, policy cannot be based on socialist, liberal, or conservative ideologies, but on ecological principles alone.

"A Europe with an ecological orientation could be a forerunner of an ecological world order. It has a moral duty to do that. The EC could have a unique opportunity to lead its citizens across narrow national boundaries and not accept built-in coercion."

If the expressions "peace" and "defense" can be retained, it can only be done in an ecological society.

The necessary alternative to revolution and reformism can then be created by the people themselves. The ecological movement has shown that real change is possible. And what is more: its time has come.

Contents

The manifesto, greatly abridged, contains the following:

Overcome technocracy, for it pits people against people, people against nature, and state against individual.

Create a united Europe. Countries must belong together organically.

Demand full participation in all of society's decisions.

Favor a people's energy—more energy has not led to a better society.

Give meaningful jobs to everyone.

Create a society without experts, which gives people the opportunity to think and decide for themselves.

Give training in ecological thinking.

Make laws to protect the weak.

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CSO: 5000

PROGRESS, PROBLEMS IN TREATMENT OF RHINE WATER EXAMINED

Cologne RHEINISCHER MERKUR in German 15 Jun 79 p 10

[Article by Udo Rudnitzki: "We Might Just as Well Gargle With Cyanide"]

[Text] The Rhine is "enriched" with 6,000 new chemical substances each week. The FRG government's assurances that "Europe's biggest sewer" is healthy once more and that it contains mostly relatively clear water, can be diagnosed, even at a cursory glance, as a self-serving rumor. In truth, the Rhine is a moving battlefield in the "undercover chemical war." Whoever enters it will not perish; but he will undergo some changes.

There we have it: Europe's sewer, the glorious Rhine, once more offers something pleasant between Basle and Duisburg; to be specific, something which brings joy to a fisherman's heart: species of fish which we do not really know any more. The water is alive with such marvellous organisms as *Cyprinus carpio*, 30 to 70 cm in length, or *Salmo trutta iridea*, more commonly known as rainbow trout. Fourteen kinds of fish (designated as "experts" by the FRG government) can once more be found in the Rhine River's cloudy waters. And to everyone's amazement, they are alive!

Should this not be reason enough for Bonn's top politicians to rejoice and to prove to the ever dissatisfied protectors of the environment that the Rhine, our big beautiful river, has become cleaner, and that it is totally inappropriate to call it a sewer, a designation invented by those malicious souls? If you believe the FRG government, 20 million people who reside in the Rhine drainage area and obtain their drinking water from the Rhine, are heaving a sigh of relief. Their drinking water problems are solved forever. Should we not believe the fourteen "experts" swimming in the Rhine?

But should you take the trouble to travel the length of our great and most valuable river; should you muster the courage to ask those who are responsible for our drinking water, i.e. the water works, you would hear some terrible stories.

Says Helmut Zander, president of the German Gas and Water Association: "Chemical substances introduced into the water which are difficult to dissolve cannot be dissolved by means of biological treatment plants. That is our problem, and we must emphasize it. Water pollution control is therefore ineffective, because insoluble substances or those that are difficult to dissolve remain in the water; and these substances are a particular worry to us in producing drinking water. Our backs are to the wall. We are no longer able to produce drinking water out of any untreated water while maintaining the appropriate safety margin."

A number of scientists have said the same thing over the years; but this has fallen on deaf ears when told to environmental protection experts employed by the political bureaucracy. Says Prof Heinrich Sontheimer, water hygiene expert at the Engler-Bunte Institute of Karlsruhe University: "As far as oxygen content is concerned, the water has indeed become somewhat 'cleaner'; after all, a few fish can live in it once more. But just because they can survive does not mean that they are edible, because they harbor some toxic substances. What I mean to say is that one swallow does not make a summer."

As far as the FRG government is concerned, all this is much simpler and devoid of problems. As proof of this, look at the advertising campaign with its 14 "experts." To quote verbatim: "Pike, carp and tench, which had become more and more rare in past years, are once more feeling at home with Father Rhine. This makes the fisherman happy, even if their taste still leaves something to be desired on occasion. How did this come about? Are there no more factories on the river banks? No more cities? Of course there are. Nothing has changed. And still it is different: better. The river has been saved from suffocation by responsible legislation and investment of [DM] billions on the part of occupants of the Rhine waterfront. This proves that an economy does not have to be healthy at the expense of a healthy environment."

That sounds nice and plausible. It sounds as if the Federal politicians' public relations managers had never heard of hygiene institutes, of limnologists, or of research results by water treatment plants. Like those by the Netherlands' Dr Cees Poels of the Monitoring and Research Institute of the Netherlands' KIWA Waterworks. He kept one of the "experts," *Salmo trutta iridea*, the rainbow trout, under constant observation for 18 months. Poels exposed it to Rhine water, taken from the Lek, a branch of the Rhine in Holland, and to ground water of drinking water quality.

After 18 months had passed, he gained some terrifying insights:

- the trout exposed to Rhine water had a weight loss of almost 50 percent;
- the diameter of their livers increased by more than 30 percent;
- their blood hemoglobin decreased by more than 30 percent;
- their blood glucose content increased by almost 50 percent.

The Dutch researchers could come to only one conclusion: "Rhine water is chronically toxic for rainbow trout, in other words, highly poisonous; it is acutely toxic for the trout's eggs and young. Finally, these fish are unable to complete their normal life cycle in Rhine water."

But the FRG government's 14 "experts" said: "We can swim in the Rhine again." The trout should be grateful to the ministry, even though the Dutch research report says the following: "We have found that structural genotype changes in the gills and sexual organs of dogfish increase markedly when they are exposed to Rhine water. Inasmuch as many mutagenic substances are carcinogens as well, i.e., cancer-producing, this constitutes a potentially serious effect. While these toxicological investigations were carried out only in fish and bacteria, the results indicate that Rhine water quality is such that it is impossible to predict whether or not dangerous substances could be ingested through drinking water."

Where can we find a whipping boy for this? Perhaps in the chemical industry? After all, about 6,000 new substances are created every week and are at least partially introduced into surface water. Nothing or nothing much is known about them. In the meantime, water experts talk about a "chemical war," which is said to be waged in the water resources.

Just recently, the International Study Group of Rhine Drainage Area Waterworks (IAWR) called attention to some great hazards:

--Here we have salt coming from the Alsatian potash works; there is salt from the Ruhr mines; then there is salt being poured into the Rhine by the soda industry, and of course rock salt and salt used for water softening in industry and in the home. Year after year, the Rhine contains about 10 million tons of salt--enough to load 950,000 trucks. The Rhine waterworks have come to the conclusion that during the last 8 years there has been no noticeable change in Rhine water salinity.

--Then there are free, organic chlorine compounds, which are toxic substances. Says the LAWR: "Toxic substances, e.g., organic chlorine compounds, increased from 6 milligrams per cubic meter in the Bodensee [Lake Constance] to 87 milligrams per cubic meter in the Rhine near Wittlaer, a 14.5-fold increase or, expressed differently, 4.2 times the amount of all soluble organic substances. This makes for a very alarming situation and we must not succumb to the illusion that everything is in excellent shape."

Then there are the phosphates in Rhine water. Here too, the Rhine waterworks state the following: "The rising curve of phosphate pollution is frightening. The increase coincides specifically with the increase in the world's use of chemical fertilizers. The consequences are obvious. Even if the Rhine, upon leaving Lake Constance, shows phosphate concentrations of one-tenth to one-twelfth of those in Holland, the effects of those concentrations are clearly observable."

The Ijssel-Meer, which today is a shallow fresh water lake, is totally clogged with algae as a result of nutrient pollution. The phosphates derive mostly from domestic effluents, depending on their country of origin up to 79 percent; from industrial effluents up to 13 percent; from agriculture up to 17 percent and from the atmosphere up to 12 percent."

What was it they taught us in school: "Water--the basic substance of all life?" Would it not be worthwhile to reflect today on the fact that this valuable resource, which we waste so thoughtlessly in our households, cannot increase; that, on the contrary, it could become in short supply as a result of periods of drought?

There are after all sufficient historic examples which prove that entire cultures caused their downfall merely by careless use of their water resources. And is it not true that other cultures sanctified water, which was their guarantee of survival? We in our highly industrialized countries are today standing at a threshold; the belief that technological progress would take care of providing automatic home delivery of drinking water at any time is long overdue for revision.

But the FRG government has its "experts." We can be certain that these 14 "experts" are nothing but living corpses. But "they feel quite at home again with Father Rhine." Too bad that fish can't talk.

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